MAN BEFORE HISTORY

MARY E. BOYLE

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REINDEER, PAINTED IN TWO COLOURS

BISON, PAINTED IN TWO COLOURS
BOTH FROM THE CAVE OF FONT-DE-GAUME, FRANCE

MAN BEFORE HISTORY

A SHORT ACCOUNT OF PREHISTORIC TIMES

BY

MARY E. BOYLE

WITH AN INTRODUCTION
BY THE
ABBÉ HENRI BREUIL
PROFESSOR AT THE INSTITUTE OF
HUMAN PALÆONTOLOGY PARIS

AND FOUR REPRODUCTIONS IN COLOUR OF
PAINTINGS ON CAVE-WALLS IN FRANCE AND SPAIN
AND OTHER ILLUSTRATIONS

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TO

MY NIECES AND NEPHEWS

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I should also like to thank the American School at Rome and Baron Blanc for kind permission to read in their respective libraries.

MARY E. BOYLE

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INTRODUCTORY

MADEMOISELLE,

. . . A short time ago I chanced upon an Oriental tale which, like a story from *The Arabian Nights*, I will try to retell to your young readers.

A poet imagined himself soaring like a genie over Space and Time. One day he paused in his course above a wild country, on the shores of a lake surrounded by steep mountains. Then he resumed his centuries-long flight above the worlds.

After thousands and thousands of years he returned to the same spot. All was changed. He found the ocean there, and boats furrowed the face of the waters. Going to the boatmen, he asked them, "Where are the lake and the mountain which used to be here?" And they answered, "Why, you must be mad! Since the world existed there was never anything here but the foaming ocean."

Ten thousand years later the genie of the poet returned to hover over the same place; where once had been the sea there now stretched a green plain, in the midst of which stood a prosperous city. Approaching a citizen, the poet said to him, "Was not the sea here in times past?" And the man of the city shrugged his shoulders and replied, "Are you dreaming? Our ancestors have always lived in this town since ever men existed." And ten thousand years later the wandering poet returned again

to where the town had been; he found there only a stony desert, across which a shepherd wandered leading his scanty flock, and when the poet asked him where the town was and its inhabitants the shepherd could only say that he had never heard tell of it.

Men are made thus; the length of geological eras, of the revolutions witnessed by their ancestors, the incessant and profound changes in the scenery of this terrestrial stage, the phases through which the human actors passed in preceding periods—of all this they remember nothing. They are ready to suppose that the world was born yesterday, and has always worn an unvarying aspect, identical, or nearly so, with that which they now behold.

The reason is that humanity has lost the recollection of the first steps of its career. What has happened to humanity happens to each of us when we tax our memories about the first years of our youth. However young the readers of these pages are, their remembrance of things will be very brief if they look backward. Through a fog of lost recollections, in hazy surroundings and at uncertain intervals, a few haphazard facts will stand out, two or three faces seen dimly, the symbols of their first steps on the road of life.

The memory of nations is no less brief; were it not for books and manuscripts for the more recent periods, were it not for inscriptions, bricks, or coins which allow scholars to reconstruct something of that past which, after all, is but slightly removed from us, there would remain little to tell—hardly more than a few names of places or exceptional people floating above the abyss of oblivion. But round these idealized faces, overtopping the common stature of men, would

be grouped a thousand impersonal elements that have remained without any legitimate owners in the memory of generations. Was it not thus with the great founders of kingdoms in antiquity and even more modern times, from the days of Orpheus, Hercules, Rama, and Gilganis, to those of Dido, Romulus, and Charlemagne ?

When we go back to those times before writing fixed the trace of certain events and certain great people, when we enter those distant and lengthy periods of prehistory, the darkness of the past grows denser, man's recollections are uncertain, the eye of memory explores with difficulty the distant vistas of the past, the boundaries of which grow blurred on the horizon of the ages.

There are no more inscriptions naming heroes and kings, cities and peoples, but only anonymous fragments, worked flints and bones, buried in the caves or in the alluvial soil of rivers, which only scholars can distinguish as they lie in their shroud of sand or clay. That is all which can throw light—the cold light of material facts—on the history of the origins of our race, of the stages of our civilization.

But if the scholar, taught in no uncertain way by the lesson of these fragments, turns back to scrutinize the oldest recollections of nations, the only existing legacy of untold numbers of generations, he may discover that, when interpreted by the light of what his explorations have taught him, these ancient traditions are rich in actual memories, and not merely the outcome of gratuitous inventions, or the fantastic work of poets and ingenious tellers of tales. They retain the mark of moral facts of capital importance, of which mere bones and stones would

not tell us a word. They are at the root of all human social evolution, and under symbolical forms they still dominate the beliefs of all civilized peoples. An historian may even find in them, in an extremely simplified form, a reduced sketch of the great primitive stages through which humanity passed in its early days.

The memory of a delightful garden, a milder clime where newly born humanity lived naked and without toil on the fruits of the earth, corresponded fairly well to those distant ages in which under another latitude the first scattered families lived on the fruit they plucked, in a mild climate where the protection of a garment was not needed.

The sinking of the South Asiatic continent where those first inhabitants lived, the great voice (inexplicable to primitive people) of the cracking of the earth's crust, the terror of the lurid flames in the live craters bursting through the fresh fissures of the shifting soil, no doubt drove our ancestors to safer but less clement regions. The bite of frosts of the glacial periods, too keen for their naked bodies, forced them to adopt clothing. The rarity of fruit obliged them to gather herbs and roots, and soon to seek by hunting more substantial food as well as those skins of animals which were so necessary for protection against the inclemency of the seasons. The pursuit of uncertain means of subsistence became an incessant and often dangerous labour, till the day when in the effort to escape from the grip of hunger the wandering pastoral life of shepherds, and the sedentary existence of agriculturists who are riveted to the soil, sprang up in various human groups.

Eternal rivals these—the shepherds and the farmers; for the former with their flocks pay no heed to the cultivated fields of the latter: their way is to raze the crops or raid the granaries of sedentary peoples. The shepherd was more of a poet, more of a philosopher than the agriculturist, more spiritual too; the farmers were more materialistic, more utilitarian, and more practical. They invented the idea of property, and the first village and the first armed host was created when the first syndicate of 'landowners' assembled and organized their numbers to defend their barns and fields against wandering marauders. From their struggles sprang the first war between humans, in which the shepherds were doomed to succumb.

The soul of the shepherd opened the road to human thought, to a knowledge of nature, to philosophy, and to religion; the stubborn struggles of the farmers, by the pooling of individual discoveries, and by the division of labour, were to lead to civilization, to the discovery of metallurgy, to the art of mining, and to the foundation of nations and organized peoples.

These great features of primitive history, in which your young readers will perhaps recognize, barely altered, the silhouettes of Adam, Abel, Cain, and of Cain's sons, inventors of all arts—these great features, which are outlined in the ancient collection of traditions contained in the Book of Genesis, show that really genuine recollections of the long-distant ages are to be found there, obscured no doubt and out of perspective, and grouping under three or four outstanding names general facts which affected thousands of generations.

The sacred writers, whilst recording ancient traditions thus reduced to a mere outline, had only a very vague suspicion of the immense length of the periods, and of the vast setting in which their actors were placed; at the most one might note that in attributing to their lives a fabulous number of years they betrayed unconsciously a vague feeling that they were dealing with stretches of time greater than those of which their contemporaries had a clear idea.

Thus, putting aside the absence of perspective in time, and the extreme sketchiness of the events unfolded, brought together under three names which personify a state of things which existed for thousands of years, one must recognize, in the light of our positive knowledge, that the 'wisdom of the nations' expressed in Holy Writ goes farther and deeper than the intuitive inferences of a Lucian or a Bossuet.

Your book will teach your young readers who are already familiar with the Scriptures to know that to appreciate their real meaning they must lend an ear to the lessons extracted from the earth, to the answers yielded by the contents of caves, from ancient or recent glaciers, from raised or sunk beaches, from the stretches of alluvial soil brought down by rivers.

Stones or bones will be henceforth for them the indispensable context necessary to understand and interpret the great traditions of Israel.

H. BREUIL

THE PALÆOLITHIC OR OLD STONE AGE, WHEN MEN SUBSISTED BY HUNTING

1. Lower Palæolithic

Chellean. Warm climate.
Acheulean. Cooler climate.
} Mauer and Piltdown races. Coarse, rough tools.

Mousterian. Very cold and wet. Neanderthal race, extending either side of the last glaciation. No art, and stone tools principally made of flakes. This period existed from about 50,000 B.C. to 25,000 B.C.

2. Upper Palæolithic

Aurignacian (Cro-Magnon and Grimaldi race, coming from the South). Ice receding. Rather milder climate. Artistic people making ivory statuettes, wall-paintings, and bone tools. This period existed from about 25,000 B.C. to 18,000 B.C.

Solutrean. Colder climate and dry. Invading race from the East, making fine 'laurel-leaf' lance and spear heads.

Magdalenian. Very cold, dry climate. Great artists, makers of bone-barbed harpoons and needles.

The Solutrean and Magdalenian periods existed from about 18,000 B.C. to 10,000 B.C.

Azilian. Climate that of to-day. Invading people from the South, makers of stag-horn harpoons and painted pebbles. About 10,000 B.C.

THE NEOLITHIC OR NEW STONE AGE

Invading people. First agriculturists, making pottery and keeping domesticated animals. About 8000 B.C.

Written history began in the Bronze Age, about 3000 B.C.

The sequence of these civilizations differed in different parts of the world; in some parts not all stages have existed.

MAN BEFORE HISTORY

CHAPTER I

AGES AND AGES AGO

THIS Earth we live on is the most wonderful keeper of secrets. Try as hard as we can to find out its age, and how it was formed, and the various stages through which it has passed, yet it only laughs to itself over our mistakes. We have no choice but to go on guessing and not minding the mistakes, because that is the only way to find out the truth. So you must remember that there may be many things in this book which a few years hence we shall all know are mistakes, and the old Earth will be chuckling at us as always.

It is not so very long ago that the people who felt very wise and thought they knew what the rest of the world should believe and learn said that the Earth was about six thousand years old, and was made in a week. These ideas were printed in books, were taught to every one in schools and churches, and it was thought very wicked to hold any other opinion. No one would have believed a person who said that the truth was very different and more wonderful still. The Jews were partly responsible for these theories. They were a deeply religious people, and their wise men were anxious to find an explanation of all the problems which puzzle and worry us in life—What is this Earth we live on? How

did we come here ? Why is there so much struggle and unhappiness ? and other questions like these. The story their wise men told to answer these questions no longer satisfies us.

Well then, for many generations the Earth was said by men to have sprung into being in the year 4004 B.C., but the Earth pays not the least attention to what men say. It was rather like stuffing an old fat man into a child's pinafore. One day, some one more observant, looking closely, said, " Why, the birthday can't have been in 4004 B.C. ; by that date the Earth must have been very old, so it is silly to teach every one the wrong date, and it is a mistake to say there were no men seven thousand years ago."

It was as if the Earth gave a chuckle and burst out of the pinafore in which the minds of men had clothed it, and they saw a marvellous creation of immense age and full of wonders.

Man is the youngest child and the most beautiful of a great family, and his youth prevents him knowing exactly what came before his birth, or even much about his babyhood. So much happened on the Earth before he made his appearance at all. We can only guess vaguely what took place in the far-off dim ages when the Earth was inhabited by other creatures and not by man. The climate must have been warm and moist to foster the beginnings of all vegetable and animal life, for only in warmth can such life begin. Then for countless ages it must have been very cold. Giant rivers of ice called *glaciers* flowed down from the mountain-crests, which were higher than they are now. One can hardly call it ' flowing,' for these immense stairways of ice moved only a few feet in a year, and the great weight of

frozen water cruelly ground the rocks below, reducing them slowly to fine rubble. This rubble the ice in its progress carried down to the plains and left finally in mounds, where the warmth of the low country thawed the glaciers. It is by these mounds (which we can still trace) that we know how low down the mountain-sides the ice came. It is rather strange that this rock, which apparently was reduced by the crushing weight of the glacier to mere rubbish-heaps, should be so valuable to human knowledge now. This was the First Ice Age.

It must have been a very silent world in those days. In the summer there would be the occasional rumble and crash of an avalanche as the snow thawed and slipped downward. The summers were very short, and soon the terrible silence of great cold must have settled down again. So the slow centuries went past, and the climate changed. We do not know exactly how this change came, nor how long it lasted, but we do know that there was a time of much rain and heavy mists, when it was fairly warm, and great writhing monsters lived in banks of slime and struggled and fought and devoured each other, striving always to leave the water and wriggle about on the land, but, lacking feet for land-travel, were forced back to the slime; until the moving years once more changed the climate, and the ice came again and crushed life out with the terrible cold. The Second Ice Age now had the Earth in its grip. In the coldest times there must always have been some part of the Earth not so cold, or no living thing would exist to-day; and each Ice Age must have had a Sun Age quite as long succeeding it, when all living things rejoiced and flourished. In

time the rain returned, and the ice melted in the plains; the sun grew stronger, and beating down on the great masses of snow drew up the moisture, and the land was wrapped in dense fogs such as prevail in Greenland to-day. There were short, hot summers, but these were of no avail against the cruelly cold winters.

In time a Third Ice Age ruled Europe, more terrible than those preceding it, for the rubbish of the glaciers, called *moraine* heaps, came farther down into the plains than ever before. The monsters of the slime had been gradually replaced by mammals, such as horses, bears, tigers, etc., small at first, but increasing in size as they adapted themselves to the climate and surroundings. In those early days horses were no bigger than rabbits, and it was the struggle to live and find food and protection which developed them and the other mammals to their present size. The great cold was always followed by warmth, and it is to the warm periods that we owe the variety of animal life on the Earth. Something else was struggling to find a foothold on the Earth, and that was man. He was not exactly like the men of our day—for this was the infancy of humanity. The great cold, the lack of shelter, the wild animals which attacked him, prevented man from doing much more than keep himself alive and fashion a few rough tools out of stone. In the east of England some flint tools made by him have been found in soil of the period of this Third Ice Age.

We know so little about this time that we cannot tell very certainly how long the cold lasted, or if there were times when the climate was milder; but we know that the ages passed, for there is only

one law certain, and that is the law of change. Nothing remains unchanged for ever. With the passing of these slow frozen centuries came warmer conditions. Once more the sun fought with the great snowfields, and dense fogs hid Western Europe, but the sun seems to have been more successful this time, for in Lincolnshire, in England, in the soil laid down at that date, there are remains of elephant, hippopotamus, rhinoceros, and other animals which love warmth.

For the fourth and last time, so far, the ice swept down on Western Europe, but the glaciers never reached so low down the mountains as they did in the Third Ice Age. Through all the bitter cold, when in England the elephants, rhinoceroses, and hippopotami which had made their home there gave up the struggle and died out or emigrated, man fought his long disheartening fight for the right to live, and, fighting, developed the brain which places him above all animals, and which he has used to make his endless inventions the glory of the world.

The four Ice Ages are not always numbered 1, 2, 3, 4, but are sometimes called after four small streams which flow down the northern slopes of the Alps. The latest Ice Age, the fourth, which is the nearest to our own day, is called *Würm*, the third *Riss*, the second *Mindel*, and the first *Günz*. These names you will come across in some books on the subject, so you must remember them.[1]

[1] Many books have been written on the question of Ice Ages, their number and the length of time they lasted. Some writers try to reckon from the times of greatest cold, others from the warmest periods, others from the variety of soil brought down by rivers flowing from glaciers, and from the remains of animals found in the soil.

In days to come we may find out more about the time when ice was ruler of the world, but what is most important to us is that in those days our scarcely known ancestors by sheer dogged courage gained a foothold in a world which offered them little, and in a struggle with Nature in her most ruthless and cruel mood conquered and subdued her. We who so long ignored and still hardly recognize these great warriors inherit the fruits of their victory.

CHAPTER II

RIVERS, GLACIERS, AND CLIMATE

A RIVER is one of the most industrious of Nature's workmen. It never stops working by day or night; year after year it goes on, century after century.

We have said that a glacier is a river of ice, and that it moves very slowly, but it is just as steady a worker as a river, and where the glacier ends a river begins to carry on the labour. There is a difference, however, in their manner of working. A glacier cuts a U-shaped channel for itself, with steep sides. In its journey the rock cut out and carried along in the ice is ground to powder. Each year it cuts its bed deeper, and on reaching the plains where the ice thaws a river springs from the foot of the glacier—a river which has as cradle a crescent-shaped mass of the ground and powdered rock which has been cut out of the glacier's bed and brought down by the ice. This crescent-shaped mass is called a *terminal moraine*.

A glacier is very beautiful. The great ice-river, with rough, ridged surface and wide, dangerous cracks called crevasses (down which a man may fall), stretches up between the snow-covered mountains far above your head. If you stand on a moraine heap the glacier seems to reach the sky, and if you venture on to it, and look down into a crack, the ice

is a wonderful green or blue colour. The moraine is ugly—a greyish heap of mud and small rock fragments and enormous boulders.

A river flows down from the mountains to the sea, and on its way it either cuts its bed deeper or eats away the banks on either side. When the plain is reached the river does not flow so quickly, and so the gravel and soil from the banks and the river-bed cease to be carried by the water ; when dropped they form shoals, sandbanks, and gravel-beds, over which the river ripples.

A river coming from the foot of a glacier often alters a good deal. If the climate grows warmer the glacier melts and retreats up the mountain-side, and the river grows bigger and swifter and carries the gravel and sand cut from its banks nearer to the sea. But if the winters grow colder the glaciers creep farther down to the plain, the river is shortened, has much less force, and very soon drops the sand and gravel it was carrying. So when an Ice Age comes we expect to find that the sand and gravel banks laid down by the river when it loses its force will have a good deal of the ground rock which the glacier brought, mixed with the sand and gravel from the river-bed. There is a place near the mountains of the Pyrenees in France where all this work of a glacier and a river can be studied, and scientists go there to try and decide how many rounds there were in this fight between the ice and the sun.

When the cold was intense and the glaciers grew very big there was so little water not frozen that the air became dry. Just before or just after the time of greatest cold, bitter winds blew. On their way they whirled along clouds of dust, buff-coloured

"A GLACIER IS VERY BEAUTIFUL" 26

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sand, layers of which we find over the whole of Europe and Asia. This wind-blown sand has a curious name; it is called *loess*. If when digging down in the earth you come across a layer of this loess you can be sure that any animals' bones which you may find will be of animals similar to those living on the 'steppes' or plains of Siberia to-day, because Siberia has just that dry, cold climate, with bitter, dust-laden winds.

If you ever dig for treasures in the earth you must remember that if no one has been there before you, and the soil is undisturbed, the deeper or lower you go the older are the layers of gravel, sand, loam, or clay, or whatever you find. The lowest is the oldest. But if you are digging in a river-terrace you must remember the river's trick of eating away underneath and undermining its banks, so that what you find on top will be the oldest, while the lower layers will be the newer gravels which the river has carried down. When rabbits or badgers have been at work before you, then you will find it almost hopeless. They mix up all the soils, and while they burrow destroy the patient methodical work of countless ages.

In the east of England we find rocks brought from Norway by the glaciers in one layer of soil, and shells which can only live in a fairly warm climate in another layer, and it is by such finds that we try to trace how often the climate varied. But it is all rather uncertain, and what happened in one corner of Europe did not happen all over Europe, just as to-day Edinburgh and Rome have not the same climate.

When the glaciers crept down the mountains and

the rivers shrank, then all the plants and trees which did not like cold and needed water must have died out and the animals have started to journey to some more pleasant land ; till the sun again had a victory, and the glaciers shrank back, and the rivers rushed down the mountains, and the air grew moist, and all green things sprouted and the grass-eating animals returned. It is a curious fact that if any living thing springs up, be it grass or anything else, no sooner has it made an appearance than whatever destroys it will appear too, and the fight for the right to live will begin again.

You must not think that it needed any great change to bring an Ice Age. If a warm stream which flows near our shores and is called the Gulf Stream changed its course a little, which it might do if certain capes in America altered slightly, it is quite likely that we should find our country ruled by ice again. Once a glacier is formed it is very difficult for it to melt. The air is so cold and dry round it that the sun has a hard battle to bring about a thaw. It is thought that if some miracle could melt the existing glaciers in Greenland they would not form again ; but at present summer in Greenland means thick fogs, the result of this battle between the sun and the ice.

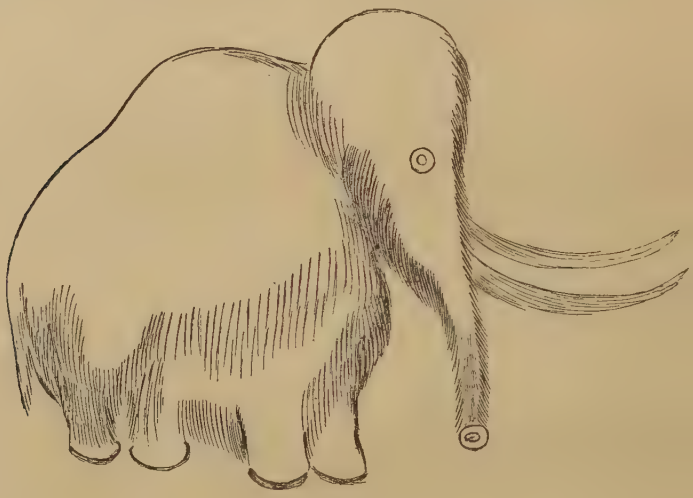
CHAPTER III

THE ANIMALS OF THOSE DAYS

ONE way to find out whether it was cold or hot in ancient days is to study very carefully the bones of animals found in the soil laid down in those times. If you find the bones of reindeer, musk ox, Arctic fox, mammoth, woolly rhinoceros, and various kinds of lemming, you know the climate must have been Arctic, for such animals love cold. Reindeer alone do not prove that the climate was Arctic, for there are several kinds of reindeer, and those whose bones are found in Southern France were a forest-loving kind, rather like those living in North America to-day. In the Polar regions there are no forests, so where the climate was intensely cold the reindeer must have been first cousins, not brothers, to those in France.

It must have been rather a grim world with great snowfields and grey, lowering skies ; no friendly trees to shelter you, and the few stunted bushes which could grow would give no protection. Think how terrifying it would have been to see advancing across the snow an elephant covered with reddish-coloured hair, having immense tusks of ivory on either side of its trunk, a curious domed head, and feet rather like immense mushrooms. This was the mammoth, which has now quite died out. Or perhaps you might meet a woolly rhinoceros shuffling heavily

through the snow—a clumsy creature with one cruel-looking horn growing upright on its snout and a shorter one on its forehead, and a thick, shaggy coat as a protection from the cold. It has been given the Latin name of *tichorinus*, to distinguish it



A Mammoth

From a painting on a cave-wall.

from its smooth-coated brother, which can live only in a warm climate. The musk ox too had a shaggy coat, but the reindeer were much more graceful, with their short, thick fur and widespread, branching antlers. They trotted about in herds and scraped away the snow to search for mosses on which to feed.

If when you dug in another layer of soil you chanced to find the bones of the wild horse, wild ass, saïga (a kind of antelope), and corsac fox, you would know that you were dealing with the days when the

ELEPHANT, FROM THE CAVE OF CASTILLO, SPAIN

RHINOCEROS, FROM THE CAVE OF FONT-DE-GAUME, FRANCE

greatest cold had not arrived, or had just passed, the days of dry, bitter winds and clouds of dust. The wild horse and wild ass like dry plains to roam over, and so does the saïga, which does not mind cold, but would not live in perpetual snow.

There were times when Europe was much warmer than we have ever known it, and those were the days of the cave-lion, the cave-hyæna, the hippopotamus, the smooth-coated elephant, the rhinoceros, and the sabre-toothed tiger—the last-named being a most ferocious beast, with great tusks like short swords, which, I am glad to say, no longer exists. In those days there must have been big forests of spreading trees and plenty of vegetation of all kinds to feed these great animals, as well as marshes for the hippopotamus to wallow in. In times of great cold no animal can live which needs a great deal of water. So you can imagine that when the reign of the ice began in the countries which had been warm a great uneasiness must have seized the droves of elephants. Only the most stupid would insist on remaining in the fast-dying forests. The others would begin to wander southward, they would not know where, but they would lumber along, crashing down trees as they made their way. There were not so many seas in Europe in those days as now, so travelling for these large creatures would be easier. France and England were joined together; there was no English Channel, and only a river separated us from our neighbour.[1] At Gibraltar there was a land-bridge to Africa, which was the first to break, and one also from Italy by way of

[1] Ireland and England were separated by a chain of lakes; there was no Irish Sea.

Sicily. Corsica and Sardinia were joined to Italy and extended to Africa. We can see in imagination our elephants padding away from a Europe which was being given over to ice, and making for Africa and the blaze of tropical sunshine. All the other animals which loved warmth would do the same, and so each time the climate changed much of the life of the country—both animal and plant—would alter. These changes were gradual; the ice did not suddenly disappear, nor did tropical forests spring up in a night. Many animals which preferred great cold lingered on into the times of retreating glaciers and dry, cold winds, trying to get used to the new conditions. So sometimes we find that Arctic-loving creatures existed side by side with the animals which preferred heat, until one kind of beast or the other gave up the hopeless struggle and either died or moved off. The grass-eating animals would give up the battle more quickly than those which prey on each other, since vegetation is more easily affected by climate than animal life.

You can see now how useful are the bones of those long-dead animals in helping us to picture this Earth ages before man had invented the art of writing or of telling stories, and even before man existed at all.

CHAPTER IV

WHO WAS THE FIRST MAN?

WHO was the first man, and where did he come from?

I wonder how many thousands of people have asked that question and puzzled over it for years, and still no one can give any definite answer. All we know is that man did not appear suddenly as a new creation dropped from the skies. Like everything else living on this Earth, he came gradually to his full beauty and strength. How many failures, how many fresh starts, how many victories were won before man arrived at the stage in which we know him will probably never be quite clear to us.

We do not know how these early people lived, where they lived, what they ate, or when they first thought of making other things serve them besides their own hands and feet and natural strength. But we know that in the days of the Third Ice Age a creature existed who made very rough stone tools of a hard material called *flint*, because we find these tools in soil of that age; and since no animal has been known to make them, and as savages make them still, we think man existed then. Scientists have tried to imagine what sudden idea or act would first start this creature, who had not yet a human mind, on the path which was to lead to such wonderful results. It is probable that these early people lived in the

dense forests which in certain ages covered our land —forests that were always to be found in some parts of the Earth even when ice ruled the greater half of the globe. There were too many ferocious animals walking about on the ground for such an unprotected creature as man was in those days to venture within their reach, with only a chance stick or stone as a weapon. So these strange beings probably swung themselves from tree to tree, and lived much the same life as monkeys do now in the jungles and forests. Some men think that at a date when the forests were getting scarce, and enough food could not be found in the trees, a mother who had nothing to give her babies left the tree-tops and, daring the great perils of attack from the monstrous animals who walked the Earth, ventured to the ground. If there is any truth in this it was courage and self-sacrifice which prompted the move. There is another question which puzzles us here. Suppose it is true that it was to get food that these early people first left the trees, how was it that they ceased to be four-footed and came to walk upright? It may have been that a mother wished to carry her babies, who could not make their way through the dense jungle, and so, needing her arms, found she could walk well enough on her feet. Or it may have been that the food the children wanted grew about the level of her head, and reaching up she gradually learnt the habit of standing erect. Or it may have been that the brain was already developed to a certain extent in these ancestors of ours, and instinct led them to preserve this most valuable possession, and try to keep it out of the way of the monsters with trampling feet. Certain it is that

whilst they lived in the trees they must usually have looked down, but once on the ground they must have learned to look up.

Nearly all people who have studied this subject are agreed that it was during the Fourth Ice Age (though some say rather earlier) that this creature, in the fierce struggle to exist in great cold with only caves for shelter, first developed what we know as a human brain. It was not such a mind as clever people have to-day, for that is the result of centuries of effort, but a brain which could reason and plan and make life less hard by invention.

In spite of all his efforts, life must have been very hard for man. We do not know when the use of fire was discovered; even in the very earliest days we find traces of it. But with the exception of fire there were no comforts. Men lived in the mouths of caves; they dared not venture far inside, for a cave-bear could so easily have wandered into the entrance and made his home there, blocking the only way of escape. It is in the mouths of caves that we find the 'hearths' of these old folk; a little burnt earth or rock is all that remains of them now. Near by we may happen to find some bones of the animals they ate. They had no clothes; when the climate was warm the hair which grew all over their bodies would be sufficient protection, and in colder times with the help of their rough stone tools they killed cave-bears and other animals, and wrapped themselves in the skins. We know there were a great many cave-bears, for quantities of bones are found, and the walls of many caves are scored, showing where these animals sharpened their claws. As for food, the flesh of the bear was excellent; in

some ages wild horses were the chief food, and no doubt men were as clever at killing birds with stones as they were at catching fish with fish-hooks chipped out of flint or carved from bone. Judging from the few skeletons found of the early people, men cannot have talked much, for the shape of the jaw was such that it is unlikely that a great variety of sounds could have been made, and conversation was probably limited to grunts and growls. The bony branches of the jaw closed in on the space left for the tongue, and this must have made speech difficult.

The men of early times cannot have been very charming to look at, with their hairy bodies, very long arms, and wide chests; they had short necks and powerful jaws developed by much crunching of bones. All we have to teach us about the appearance of men in these days are some fragments of skulls, a few teeth, and bones (such as bits of a jaw) found in various parts of the world in the soil laid down in those far-away times.

The oldest remains that we know of so far were found in the island of Java in the East Indies, near a village called Trinil. In 1891 Dr Eugene Dubois went from Holland to Java, convinced that he would there find traces of early man. His first discovery was a tooth. That does not sound very exciting. But a few months later, three or four feet away from the tooth he found a skull-cap. He went on steadily searching, and in the middle of the next year dug up a thigh-bone, and finally a second tooth. Some one else found a third tooth. You would not think much could be found out from three teeth, a thigh-bone, and a skull-cap. But clever scientists studied and measured them, and

compared the teeth of monkeys and of savages and men of to-day, and did the same with the skull-cap and thigh-bone, and came to the conclusion that this was no monkey, and yet no man such as we know now, but a creature nearer to a man than a monkey, a creature who walked upright. They gave it a dreadfully long Latin name, *Pithecanthropus erectus*. You must try to remember this name, because it is the name of our earliest known ancestor, though we cannot trace all the intermediate generations; and one has to make an effort to learn family names, however difficult they are. The scientists took an inside cast of this skull and found that the part which holds the brain was smaller than it is in a modern man, but larger than it is in any ape. The height of the creature was that of an ordinary Englishman.

So the questions about who was the first man—questions which so many generations of people have asked, and have died without knowing the answer—were not all in vain. We cannot yet say who was the *first* man, but by slow steps we are working backward, and can point to this man in Java as a very early ancestor indeed, though perhaps not in the direct line.

CHAPTER V

THE TOOLS OF EARLY MAN

IT is very difficult when we are dealing with hundreds and thousands of years to divide the ages so that we know what period we are talking of. It is easy when you read history, and have the accounts of people living in the century you wish to study, to fix the principal events by dates, so that you know at once how one battle or discovery succeeded another. But suppose you had to tell the story of the Plantagenet kings from a few bones they threw down at their feasts and a few animals they killed whilst hunting, and perhaps a skull of one of their enemies. That, you would agree, would be a difficult task.

History is a written account of the men who lived and the events which happened before our day. The subject we are trying to study now is *prehistory*—before history; and the Earth holds all the knowledge. It is no question of turning over printed leaves and learning by heart; the Earth only yields its secrets to students with immense patience, and even the most diligent may make mistakes.

I have already said that up to the Third Ice Age, which has been called the Rissian Age (from the little stream, the Riss, flowing down from the Alps), we know of no trace of man. That does not mean

he cannot have existed; it only means we have not discovered anything which resembles a human or his handiwork. So let us begin just where we can in the days of the *Pithecanthropus erectus*, and since we live in Europe and not in Java let us try to find out what our part of the globe was like in those distant times. Going as far back as we can, we find that it was much warmer in Europe than it is to-day, and the climate was less varied in different countries. The same trees grew in Central France as in Tuscany, on the borders of lakes as on the tops of the mountains. There was hardly any difference between the forests of one country and another. Planes, maples, elms, walnuts, and laurels flourished everywhere in Europe. Slowly the weather grew colder; we find out this change by studying shells which are fossilized in the rocks, especially in the east of England. But in the midst of this cold spell it seems as if for a short time the climate again grew warmer, for we find the remains of hippopotamus, rhinoceros, and the smooth-coated elephant all near Cromer in Norfolk. After this warm interval the great cold returned, for we find the remains of dwarf willow and dwarf birch, which only grow in the Arctic Circle. It was in soil of these warm days of the hippopotamus and elephant that the roughly chipped stone tools were found, the first sign of the existence of men in England.

The land altered its level a good deal in those early days; we find that it sank over a great part of England and France, though we cannot tell what caused this sinking. In the valley of the Thames an examination of the gravel terraces there shows that the land was once a hundred or a hundred and

fifty feet lower than it is to-day, and at this level rocks are found which are not native to the district and must have been brought by some glacier and left in the gravels of the Thames valley when the ice retreated. Stone tools made by man are also found.

I must tell you about these tools, which are such a help to us in studying the early days of humanity. You would not think much of them as tools now, especially those made about the Third Ice Age, or, as it is called, in *Tertiary* times. To begin with, men looked round for a suitable stone and merely chipped it as best they could into the shape wanted. Stone will not lend itself to any elaborate chipping, and men soon discovered that if they wanted to make a more delicate tool they must use a certain sort of material called *flint*. If you pick up a broken flint you will see it is a rather shiny stone with a rough white or grey surface. You may find it hard to believe me when I tell you that it is made of the same material as sponges. Yet this is true, for both are partly made of silica. Flint can only be made under a great depth of water. You know that water is heavy, for if you carry a pail of it your arm will soon ache. The higher the temperature of the water the more of this silica will be found in it; so deep down in the sea, where the weight of the water above must be enormous, and the water is much warmer than near the surface (where air cools it), the silica collects and is compressed and squeezed so tightly that gradually the drops of water between the silica grains are pressed out, and hard nodules of flint are thus made. When this flint finds its way to the land either by tides, floods, or by the sinking

FLINT TOOLS

1, 2, 3. Scrapers used by the early Aurignacians. 4, 5. Scrapers of the Cro-Magnons.
6. Tool resembling a stone axe.

of the land to sea-level, it is at first very brittle, but when exposed to the air the water remaining in it dries up, and it becomes hard, the outside being covered with a thick crust or skin called the *patina*. This skin differs in colour according to the nature of the soil in which the flint dries. Should there be iron near the whole flint will have a reddish colour, and the skin will be stained as if with iron mould. Where there is no iron the skin is white and the interior dead black; should only parts of the flint be exposed to the air the surface will be mottled—white where the air has reached it, and black where it has been protected. Although flint is brittle it is so hard that it can only be worked by itself or quartz, and it breaks in a very peculiar way. If you strike near the edge of a flint a flake comes off, and if you examine the flake and the place from which it has been removed you will find that on one piece there is a swelling, on the other a hollow. It will not always be the flake which has the swelling, or the flake which has the hollow, but you will always find it has broken in that way. The swelling is called the 'cone of percussion.' The spot where the flint was struck is often surrounded by curved lines, reminding one of the ripples caused by throwing a stone into water, and from these ripples one can tell the exact place of the blow.

Nature can break flint by the action of frost and thaw. If the temperature changes flint expands or contracts, expanding in heat and contracting in cold, and in the process the nodules of flint are often broken. You must look at the flat, broken surface, and if the work has been done by cold there will

be a tiny knob surrounded by ripple-marks. If the flint has been broken by heat the ripple-marks surround a small, broken surface instead of a knob.

Flint-using peoples have copied nature and sometimes heat the flints in a fire and then, by letting fall drops of water on a hot stone at one spot, split the flint into flakes. There is yet another way of breaking flint, and that is by pressure. If a flint is held firmly and other flints are forced across it owing to the shifting of the soil in which they are embedded, or by other means, flakes will be pushed off it. If this is done by nature you will generally find that the surface is covered with scratches made by the moving pebbles and flints passing over the one which is fixed. There is a place in the valley of the Thames where beds of gravel rest upon a layer of chalk in which flints are embedded. At one time the chalk dissolved, and the gravel pressed on the flints, and, shifting about as the

Flint Pick

underlying chalk sank, pushed flakes off the flints which were held in their chalk setting. Once again men who used flint tools copied nature, and even to-day savage peoples force flakes off the flints they wish to use by pushing and pressing with pieces of bone or stone. You will understand that it is very difficult when a flint tool is found to decide in some cases whether it has been fashioned by man or nature. It is probable that early man got his first ideas of making tools from the natural flints found in various places, and that he began by copying these. It is quite a special subject to learn all the minute differences in the handiwork of nature and man, so that when you find a tool, or *implement*, as it is called, you can decide how it was made. It is easy to tell if flint has been heated in a fire, for if slightly heated the flint will be reddened, and if it has been very hot the surface will be covered with tiny cracks.

The very earliest tools that we know of are narrow, pointed bits of stone which could be used as picks; a clumsy, pear-shaped tool which might be used as a hammer or a club for hacking or sawing; and some rounded 'scrapers,' as they are called, because they were probably for scraping the flesh from skins, or roots out of the ground. Later on men became very clever at making tools of flint, bone, horn, and ivory, but in earliest times it is hard to tell their work from tools formed in nature's factory. No doubt they picked up flints of special shape, found them convenient to work with, and if they could find no more of the same design tried to copy with their own rough skill.

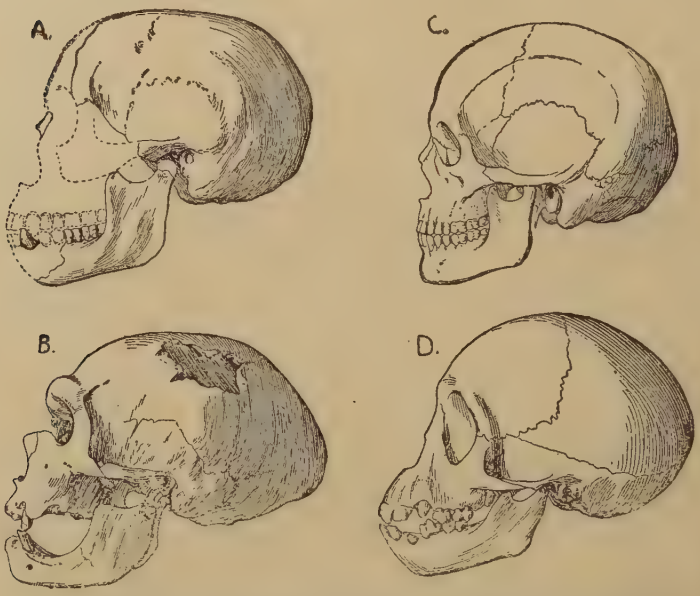
CHAPTER VI

BONES AND STONES

THE next trace we have of our early ancestors is a jaw which was found near Heidelberg in Germany, and which is said to be that of a human living in the warm period before the Fourth Ice Age, or even at a more distant date. The jaw was found in some river sands, and had evidently drifted down with the ancient river Elsenz south of the mouth of the Neckar. There is a sand-pit at Mauer, near by, the sands of which have always been of great interest to scientists; many remains of animals had been found there, and the workmen had been told to keep a sharp look-out for human bones. This jaw was found by Dr Otto Schoetensack in 1907, and with it were found the remains of rhinoceros, elephant, lion, bear, wolf, and other animals, proving that there must then have been great forests and a moist climate. Judging from the shape of the jaw, this man of Heidelberg can have had but little chin. The teeth are comparatively small, smaller than the teeth of apes, and this shows that the man did not use them as weapons.

For our next discovery we come back again to England, where at Piltdown, in Sussex, a skull was found of about the same age as the jaw of Heidelberg. A workman was digging a shallow pit for

gravel, only a few feet deep, when he came on the skull. No other bones were found with it, and this fact made some people think that the man had been beheaded; in fact, there were many who thought



A. Left-side view of the Piltdown skull. B. Left-side view of skull of a primitive type from La-Chapelle-aux-Saints. C. Modern human skull. D. Skull of a young chimpanzee.

Reproduced by permission from "A Guide to the Fossil Remains of Man," British Museum (Natural History).

the skull was that of a monkey, or of a monster in some travelling circus, and not that of a man at all. To be sure, the forehead was high, but so are the foreheads of young gorillas. Like the man of Heidelberg the Piltdown creature showed no sign of a chin, but it had large teeth worn down with use.

Near the skull were found some clumsy stone tools. This man of Piltdown has been called the 'dawn-man,' because he belongs to the very early times of humanity. The skull must have been washed down into the gravel by the river Ouse. Piltdown lies between two branches of the river. Then Dr Charles Dawson of Lewes found a piece of human bone in some gravel which had been brought for road-mending to a farm near Piltdown Common. This discovery made him search further in the pit from which the gravel was taken, and he then found a larger piece of bone, part of the forehead of a skull, the second skull found at Piltdown. After this all the gravel taken from the pit was sifted, and bit by bit nearly the whole skull was collected by the workmen and scientists. A piece of elephant-bone sharpened like a stake was found not far away, from which people think that the climate was warm in the days that the 'dawn-man' lived. The Abbé Breuil, however, believes this was the work of a beaver and not a man, being merely the result of the animal sharpening its teeth on the bone.

From these few fragments we try to reconstruct the England of those days, an England which was, as I have said, joined to France, or only separated by a river; joined also to Ireland except for a chain of lakes running down the centre of what is now the Irish Channel. The country was covered with forests, giving plenty of shelter and food to the elephants, rhinoceroses, lions, tigers, and other animals which made their home there.

There can have been but few men in those days in our country, and their lives must have been a

sort of nightmare, for any movement in the forest might mean the appearance of a ferocious animal, and either sudden death for the man or a desperate fight for life with only a rough weapon of stone, bone, or wood to help him. Big animals in dense forests would move slowly, and no doubt fleetness of foot and superior agility saved man many times from an awful death. But what a life of fear his must have been! In peril by day and night, compelled to take every risk to keep himself alive and fed; one false step, a miscalculation in speed, an hour's illness, and his life would be forfeited.

"A ROUGH WEAPON OF STONE"

From "Cave, Mound, and Lake Dwellers," by Florence Holbrook.

By permission of Messrs D. C. Heath and Company.

Yet he struggled on, and woman struggled with him, in equal peril, with her children clinging to her and depending on her; and when you think of the long periods of time through which they fought on with all the odds against them, can you wonder that mankind still prizes as the highest of virtues—courage?

CHAPTER VII

ROAMING

TO find out the story of these early Europeans we have to follow their example and roam from one country to another; only nowadays we cannot, as they could, walk over to France or Ireland. There is only one fact to guide us, namely, that hunting-people, such as they were, would in a temperate climate follow the course of rivers, since the animals they hunted would roam and live along the banks.

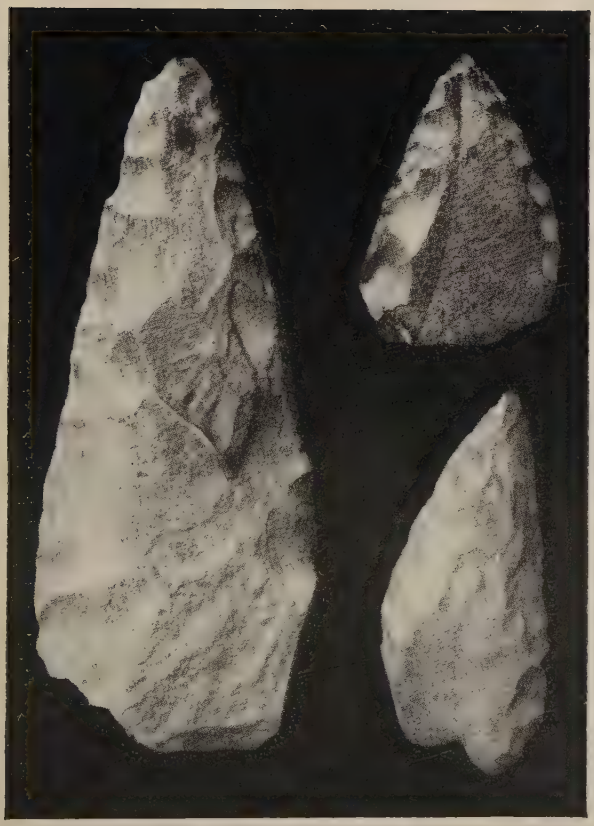
These hunters would want from time to time to renew or enlarge their store of weapons, and so our only other chance of finding a clue is to search in districts where flint is plentiful for traces of man's passage. You must remember that man had no iron, steel, or bronze, so the hunters must always have been on the look-out for flint or quartzite (which is a hard pebble), so that they could make new weapons.

The banks of the rivers Somme and Marne in France are very rich in traces of the early hunters. The earliest flint-workers on the Somme are thought to have arrived there in the warm period after the Third Ice Age. At Chelles-sur-Marne there must have been a great many flint-workers, because in the gravel and sand beds, which to-day are twenty-four feet thick, we find numbers of the earliest rough tools; in fact, these are so numerous that any tool resembling the kind found at Chelles has come to be called *Chellean.*

Probably there was a great deal of game on the Marne, and the race of hunters living on the banks grew exceptionally expert at making weapons and tools for scraping and cutting skins. Tools of the kind discovered in quantities at Chelles are found all over the world with the exception of Australia. This does not mean that these tools were all made at Chelles, but only that the needs of primitive man are few, and his unskilled work is the same all over the world. No doubt hunters came from far and near to get tools from the flint-workers of Chelles; the pursuit of elephants and rhinoceroses would lead them in that direction, as we know from the bones of these animals found in the gravels with the flint tools. The keen hunters (and everyone would be fairly keen when life depended on their prowess) would certainly learn to chip flints like the flint-workers of Chelles.

On the Somme at a place called St Acheul, near Amiens, there are remains of flint-works. A stretch of the river-terraces here, nearly a mile and a half in length, was searched and studied by various scientists, and flints were found at every level from the top terrace about 230 feet above sea-level to the river flowing 155 feet below. The flint-workers must have lived here all through the Old Stone Ages.

Generation after generation of these men worked here at their craft, and travelling hunters came and bartered for their goods, no doubt bringing skins of animals, threaded teeth, and the various objects prized for dress or ornament. That would save the flint-workers from going out to hunt for skins themselves, though they would always have to defend



Some Acheulean Tools 50

their homes from the fierce beasts which surrounded them, and would have plenty of opportunity to try new forms of weapons. The workers at Chelles had not learnt to make such good tools as those at St Acheul; the *Acheulean* workers, as they are called, improved on the rough Chellean tools. Their stone axes had more even edges, and they made a broad, oval tool which could be used as a hammer, a digging tool, and in various other ways. The stone axe of these times was not much like a modern axe. Man did not think of giving it a wooden haft or handle, and no worker to-day would prize these clumsy stones, unsuited for anything but the roughest uses.

Later on they made flint knives and awls, and gave a curious twist to their stone axes. We do not know if this twist served some particular purpose, or if it was a mere accident in the chipping.

Ever since Chellean times the climate of Europe had been getting steadily colder. The days of warmth and damp had passed, and though it was not yet very cold, and man seems still to have lived mostly in the open, cold, dry winds blew, carrying in their course clouds of dust. The straight-tusked elephant still wandered about Germany; wild oxen and bison grazed in the meadows.

Then some great disturbance took place in the land of Southern Europe, the coasts subsided, the Mediterranean became a sea instead of two lakes, and the last of the land-bridges to Africa was cut through—that into Italy by Sicily and Sardinia. The Gibraltar bridge had broken before. No longer could the elephants, lions, tigers, rhinoceroses, and other animals roam at their will from Europe to Africa, nor the wandering hunters follow them.

The bridges were broken, and henceforward there will be great differences in the animals and men of different countries, for the sea divides them.

At the same time as the bridges were broken there was a rise in the land in the centre of France and Germany. France and England, however, were still united, and there was no English Channel; the Solent shows the course of the river which flowed between the two countries.

The icefields of Scandinavia began to advance southward, and the flint-workers obeyed their instinct to move in the same direction. Though they did not desert the Somme, many went to work on the banks of the Dordogne and of the Garonne, a river which drains the eastern slopes of the Pyrenees. Even in sheltered valleys the flint-workers chose the warmer and sunnier spots, and some preferred to live in caves.

The hippopotamus had moved off to Southern Europe, and the smooth-coated elephant followed suit. These two were the first to feel the oncoming cold; and down from the north once more came the woolly elephant and the woolly rhinoceros. Cave-lions and tigers and hyænas did not mind the cold so much; they probably grew an under-coating of fur and an over-coating of long hair as a protection. They disputed the caves with men, and it is to these caves we must turn as the years go by and the cold increases, in order to find out what man was doing in this restless world, where one set of dangerous animals succeeded another, where the glaciers crept forward, the sea roared in over the land-bridges, and man faced his enemies with a chipped flint and his slowly developing brain to help him in the struggle.

CHAPTER VIII

CAVE-DWELLERS

NEAR the small town of Krapina in Northern Croatia is a rock-shelter. Long ago the river Krapinica washed into it, but it now stands eighty-two feet above the water-level.

When modern scientists first discovered it in 1899 it was full of sand and gravel, fragments fallen from the roof and walls, and stray stones and boulders. But among all this were thousands of animal bones, and hundreds of human bones, with quantities of stone tools. The human bones included many of children, and they were in such small pieces and there were so many traces of fire in the cave that some people thought the early folk who lived here must have been cannibals. As a rule cannibals split bones lengthwise to extract the marrow, and all these bones were split across. As human bones were found in various layers of soil, man must have lived here in successive ages; and, as round the hearths were found pieces of charcoal, broken and burnt bones, and flint tools, it may be that it was only during the colder months that this cave was inhabited. Crouching round their fires, these people first knew what it was to have a home. If some died there, they would be left or buried, and the place forgotten, so that hearths have been found above a grave; or in days of bitter scarcity

they might form food for the survivors, or furnish a meal to the prowling wild beasts.

When the spring came, and some watcher on the hill-top reported the return of the herds of bison attracted by fresh pasture, the cave with its fires and lurking shadows would be deserted, and out would go the men, women, and children to the free life of hunters, till short days, frost, and snow drove them back to their cave-house.

These people of the caverns were short, the men about five feet three inches, the women barely five feet. This must have been convenient for crouching in caves. They did not carry their heads very erect, and the upper part of their bodies was generally bent forward. Their legs were remarkably short from knee to ankle, which shows that they were no runners and moved rather clumsily and slowly. They crouched over their work or round their fires, and did not sit. They had very large hands, but their thumbs were not set on at the same angle as ours, so they had not as delicate and accurate a grasp as we have.

There is a great grotto called the cave of Castillo, in Northern Spain, which was inhabited by man long before the times we are speaking of, whilst still the hunters roamed Europe before the coming of the cave-folk. The entrance to it is on the side of a hill, and overlooks the valley, so no enemy could approach unseen, and no doubt barricades for the mouth of the cave would be erected easily if an attack was expected. In early times the cave led far into the heart of the mountain. Each generation left its rubbish on the floor—bones, hearth-stones, tools, and scraps of food; so gradually the level of the floor rose, until in later days (long after the times

we are speaking of) there were forty-five feet of rubbish on the floor. The old entrance was blocked up, and a higher one was used, till the most recent inhabitants merely crouched under the roof at the sides.

Blocks of rock fell down over the entrance to this cavern, and its very existence was not suspected till modern scientists discovered it in 1903. So the Earth keeps its secrets, burying the traces of humanity. All the time we were being taught, and honestly believed, that the Earth was only six thousand years old, it kept hidden in this cavern the proofs that life had existed not for six, but for fifty thousand years.

Century followed century, race succeeded race, tribe drove out tribe; but in every age men lived in this great cave, probably a whole tribe at a time, for people could herd thickly when some hearthstones and a few flints were all the household furniture. No doubt as each tribe arrived they swept the rubbish of the last inhabitants toward the back of the cave, smoothed the earth on the floor, and the home was ready to receive them.

You must not think the cave-people never travelled; they did; for tools of the kind they used are found in Spain, Italy, Portugal, Austria, in Germany and Poland, by the glaciers of the Alps, in England, and at a great many places in France. But when it was so cold that they had to huddle into caves for warmth they would wait till the summer to travel, when the wild ox and bison grazing on the fresh grass would provide them with plenty of food.

A good many of these journeys would be taken to fetch new tools from the districts where flint was plentiful. There in summer they would find the flint-workers busy with their trade along the river-banks

or on the uplands. But as a rule, owing to the change of climate, men sought out the districts where limestone is plentiful; for limestone is porous, and lends itself to the formation of caves and overhanging cliffs. Shelter was the first necessity, so the sunny sides of limestone valleys were peopled by these clumsy figures with their shambling gait, making uncouth sounds to express emotion, for speech, as we know it, was still denied them. Unless there was a natural chimney to the cave they kept near the entrance for fear of being stifled by the smoke of their fires.

One of these inhabited caves must have been a curious sight with the short, squat figures crouching in the shadows, lit one moment by a spurt of flame, and the next swathed in acrid smoke. Chattering, grunting, squealing, the children playing amid the old bones, dust, and charcoal on the floor, seldom venturing far from their mothers, watching eagerly at meal-times for the scraps which the men threw them, and fighting among themselves like puppies.

We owe our knowledge of the appearance of these cave-dwellers to the discovery of a skeleton in a small cave about six feet high in a limestone valley called Neanderthal, in Germany. A small stream, the Düssel, flows below. Some workmen were digging loam there when they came on human bones. Probably it was a complete skeleton, but the workmen, not realizing its interest, scattered and crushed a good many bones. A certain number were preserved, and are now in the museum at Bonn. In a small cave near by the bones of cave-bear and rhinoceros were found.

On account of the discovery of this skeleton humans of this age are referred to as the *Neanderthal* race. These Neanderthal folk had big heads and

VENTA DE LA PERRA

A valley such as cave-men chose to live in, with a river and limestone hills.

plenty of room for their brains, and the fact that the left side of the skull is bigger than the right shows that they were right-handed. The nerve-fibres which control the arms and legs cross at the base of the brain, those from the left side of the brain going to the right arm and leg, and those from the right side of the brain to the left arm and leg; so, by noticing which side of the brain is the larger, we know which side of the body has been most used.

One of the differences between the Neanderthal people and later races lay in their teeth. The roots, instead of tapering to a point as in modern people, were like a strong pillar supporting the crown. The very tough food they lived on developed their jaws. No civilized race has teeth or jaws such as these people had, nor does it have their retreating foreheads. The greatest difference between these early people and ourselves lay in the construction of the spinal column, which was such that they had a stooping, shuffling gait, and not the erect, free walk of a modern man.

These squat cave-dwellers, as far as we can see, have no direct descendants to-day. But, savage and primitive as they were, two notable changes had taken place in the mind of man. He was varying the shape and uses of his tools, and no longer did he invariably leave his dead to moulder where they fell or be devoured by wild beasts. From now onward we find people buried with ceremony. The dim idea of a future life must have occurred to man. Religion was born.

We have now reached the point where Europe is getting steadily colder, where only the cave-lion and cave-hyæna remain of all the animals which flourished in the time of warmth. Europe is to become the home of reindeer.

CHAPTER IX

THE MAMMOTH AND REINDEER

FOR hundreds, nay thousands, of years the Neanderthal race lived in Europe. During the Fourth Ice Age the glaciers had crept down, and the climate was so cold and damp that reindeer reached even the south of France. Mammoth, giant deer, bison, and woolly rhinoceros were hunted by man in those days.

The icefields of Scandinavia were slowly approaching the Alps, but, though both Europe and North America shared this cold period, there were local variations of temperature. It seems, for instance, to have been comparatively warm in the valley of the Thames, for remains of birch, pine, alder, elm, hazel, yew, and royal fern are found there in soil of this date, and these show a mild climate.

The mammoth was one of the principal animals at this time. It was an elephant, but not much like the modern African or Indian elephant. It was covered with a thick coat of wool and hair, the hair nearly reaching the ground, and the wool forming a cosy undergarment. This hair and wool were varying shades of brown. There was a hump on top of its head and a hump between its shoulders; its tail was short, and it had huge, curving tusks. Frozen mammoths have been found in Siberia, and so we know all about them, even the food they ate.

In summer they browsed on wild thyme, crowfoot, grasses, and sedge, and in winter on the juniper, stems of willow, and whatever winter plants they could find. Thyme and crowfoot seem but small plants to feed an elephant.

The mammoth had one almost inseparable companion, the woolly rhinoceros. Like its friend, it had long hair and an under-covering of wool,

Skeleton of Mammoth

golden-brown in colour. It boasted two horns, one behind the other, the front one on its nose being the bigger. It also had a hump, and lived on grass and small plants, but it preferred not to go too far from the great glaciers. Probably the food it liked best grew near the ice, so when the mammoth wandered too far south the woolly rhinoceros refused to accompany its friend to Italy, and awaited the mammoth's return in France or Germany.

This was not the first appearance of reindeer in Europe. During the Third Ice Age, in the days when the glaciers made their farthest advance into the plains, the reindeer journeyed along the borders of the icefields and reached Southern Europe. At

the time we are now speaking of they came as far south as the valley of the Vézère, a stream which flows into the Dordogne, and is almost on a level with Bordeaux.

Our cave-dwellers hunted the reindeer, using the skins for coverings and eating the meat. The deer crossed the frontier of France, and spread over the north of Spain along the coast of the Bay of Biscay.

Round the hearths of the Neanderthal men we find the bones of all three of these animals—the mammoth, woolly rhinoceros, and reindeer. Some of the bones are split lengthwise, showing that the marrow had been taken out, and probably some of the fat was used for torches, for we find no trace of lamps at this time.

It is difficult to imagine how big animals like the mammoth and rhinoceros, protected by their thick covering of hair, could have been killed with the flint spear-heads and other stone weapons which have been already described; all the more so as men of this age had almost ceased to use the very heavy lumps or 'cores' of flint, with only a flake or two struck off, which had been made by the workers of St Acheul for the race of hunters before the days of the cave-dwellers. They now preferred to make their tools of flakes of flint struck off a lump or 'core,' which of course produced a much lighter tool to wield.

As the cold grew more intense, and they were forced to stay near the caves where they could shelter, the men of this time used less flint, and their tools and weapons were fashioned of local rock often very inferior in quality. The flakes were

trimmed into shape on anvils of bone ; some of these anvils, covered with scratches and bruises, have been found.

Some roughly shaped limestone balls may have been used as weapons, but they were too big for an ordinary sling, though if attached to a thong and whirled round the hunter's head they would have been effective. Perhaps pits were dug and concealed with branches, so that any heavy animals which fell into them would find it almost impossible to struggle out. Even so it would be no light task to kill and skin them.

The most usual tool found in soil of this age is the scraper. It was made of a flake struck off the main core of flint, and then by taking off little flakes the edge was sharpened and made suitable for scraping skins free from flesh and fat, in order to make them ready to be used as garments. An almond-shaped flint, pointed at the end, and for this reason called a 'point,' was the knife the people of these days used.

The most interesting of these homes to study is the cave of Le Moustier, on the right bank of the Vézère, that small river flowing into the Dordogne. The cave is fairly high above the river, and there are signs that men lived not only in the cave itself, but on the terrace under the cliff in front. When scientists were digging in this cave in 1908 they unearthed a most interesting skeleton of a Neanderthal man ; and because of this find at Le Moustier the people in France and Southern Europe of this age are often called *Mousterians*. These Mousterians are men of Neanderthal race, just as Frenchmen are also Europeans, and were more modern than

the *Acheuleans*, who also lived in France. Nevertheless, in the course of centuries slight changes in appearance had arisen, and they were a step or two in advance of their German relatives.

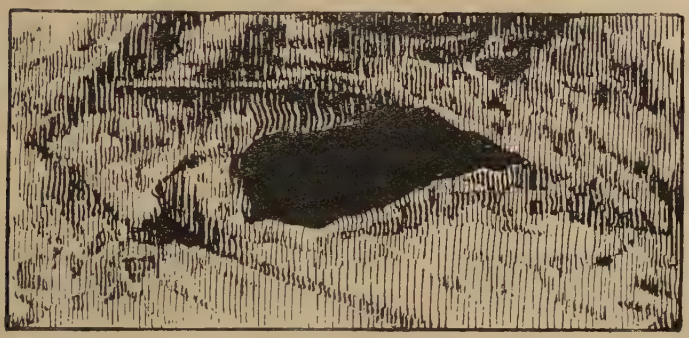
The skeleton found in the cave of Le Moustier was that of a youth of about sixteen. His head rested on a pile of flint fragments forming a sort of pillow. His right arm was bent under his head; a very well-made stone axe lay near his hand, and the burnt and split bones of wild cattle. Whoever buried him gave him a weapon and food for his journey into the Unknown. This youth was of square build, strong and short, and he was of the cave-dweller type, with short forearms and shins, so that he was not a fast runner.

A few miles to the east of this cave of Le Moustier, in a grotto near Chapelle-aux-Saints, another carefully buried skeleton was found. This time the person buried was about fifty or more years old, and was laid in a natural hollow facing east and west. The age of a person buried is determined by the thickness of the bones and the closure or otherwise of certain junctures in the skull. There were a good many flints with this skeleton, and the bones of rhinoceros, bison, reindeer, and horse. Perhaps these were the animals he preferred to hunt in his lifetime.

Everyone was not buried with the same care as these two people. Skulls and fragments of bone of both men and women have been discovered in many places in different countries with no accompanying flint tools, no stone pillow, no animals killed for food. They must have crawled into caves, died there, and been left to decay.

These Neanderthal men spread all over Western Europe at this date.

The Mousterians of France belonged to the Neanderthal race, but they developed rather differently from that type, and made their tools differently. The cave life no doubt helped them to improve their tools, or at least to try more varieties. If people



The Front Door of a Cave

are herded together and can interchange ideas it is more likely that a genius will arise with some special talent which will benefit the whole race.

Crouching in their dark, damp caves through the long winters, with only the light of their fires or the flare of a fat-smeared torch, with the shrieking of wind, the drip of water, and the howls of wild beasts coming from the surrounding darkness, those with imagination must have begun weaving their fears into stories, holding their audience entranced. Then when one of their number died, and was left for wild beasts to devour, their slowly waking minds would ask what had happened to him, why had he left his body and the warm circle round the fire?

It would be to the story-teller they would turn for an answer to their questions, and he, who no doubt would have heard of the old race of hunters who peopled this country before his cave-dwellers, would say their friend must have gone hunting, since like the old hunters he had passed from their sight. So presently, when one died whom they loved greatly, they put the best stone axe they possessed near his hand, killed animals for food in case his hunting luck was not good, and covered the body safely so that no wild beast could harm it. Probably on many a spring morning they looked for the return of their hero, and on many a winter evening asked the story-teller for news of his hunting, and the story-teller, travelling in the land of his fancy, told them of great feats, many animals killed, much feasting, chanting the triumph and crooning the misfortunes of the dead man.

So was born poetry, and later, when speech was not so difficult, there followed the gift of song.

CHAPTER X

THE BEAUTIFUL CRO-MAGNON RACE

THOUGH we can trace a link between the Acheulean hunters and the Mousterian cave-dwellers, we now come to a great gap.

In spite of the Neanderthal race, of which the Mousterians were a part, having lived for many thousands of years in Europe, we can find no proof of any direct descendants, either in tombs or in any living races to-day. But we know that at this time, twenty or thirty thousand years before our era, a new race invaded Europe. They may have lived beside the Neanderthal folk for some time, but whether these cave-dwellers had grown weak and sickly during the great cold of the Fourth Ice Age and died out naturally, or whether this new people, who were of greater intelligence, of finer build, and better armed, simply killed off the shambling, gibbering creatures whom they found in possession of Western Europe, we shall never know.

In any case, the squat people of the caves with their wooden clubs, clumsy stone axes, and flint knives, disappeared, and with them ends what is called the *Lower Palæolithic Age.* ' Palæolithic ' is a long word, but it is the geological term for the days of chipped stone tools, and ' lower ' is added because the days of chipped stone tools were not over. Henceforward men showed more skill in their work-

manship, and the roughly chipped axes and knives of the cave-dwellers are to be found in the lower and older layers of soil.

From some part of Asia (and if they came from Asia they must have come by the Mediterranean, for the Caspian Sea was too big an obstacle), though from what part we do not know, a new race of people called the *Cro-Magnons*, from the cave where their first remains were discovered, came to invade Europe and drive the cave-dwellers from their homes. These people were about six feet in height, a race of hunters, with as much intelligence as modern people have, and with a great love and genius for art. We do not know where they learnt to develop their gifts, or how they came to be so vastly superior to the rest of living humanity. It was probably their love of hunting which drew them into Western Europe, where game must have been very plentiful since the disappearance of the old hunting race.

What must have been the feelings of the cave-dwellers when they saw these tall men and women, talking as we talk, long-legged and fleet of foot, invading their land! In most invasions the men are killed and the women saved and made slaves to the conqueror; but in this instance it does not seem to have been the case. The Cro-Magnons may have been filled with a horror of the strange-looking figures and killed them as they would have killed any wild animal, or else the Neanderthal people retreated before the conquerors, and, driven back toward the glaciers, dwindled and died out.

The Cro-Magnons seized the caves and established themselves in this splendid hunting-country, where the time of greatest cold after the Fourth Ice Age

was passing. The summers were short, but hot; dry, cold winds blew, and dust storms were frequent. Wild horses and asses were plentiful, but were only used as food; it never occurred to anyone in Western Europe to use either as beasts of burden. The discovery that horses could be trained to draw people and loads was made somewhere in Asia in later times.

At the same time as the Cro-Magnons were settling themselves in Western Europe there seems to have been another race of people in the south of France, a people who came from Africa, for some skeletons found near Mentone show negro characteristics.

The skeletons are those of a middle-aged woman and a youth about sixteen. The woman was five feet two inches in height, the youth five feet one inch; their flat, broad noses, teeth, and the peculiar shape of their chins are like those of negroes. Since they are not exactly the same as negroes it is thought that they may have belonged to a race neither white nor black, before the black and white races were so very different in type. It is probable that they came from Africa, but evidently the race they belonged to never spread far in Western Europe, for no other skeletons of this type have been found. The race is called the *Grimaldi*, from the name of the cave in which the skeletons were discovered. Though these negroid people cannot have been very numerous in Europe, it seems likely that they lived side by side with the fine Cro-Magnon people who had invaded Western Europe and driven the small cave-dwellers from their homes.

The Grimaldi folk must have been a strange mixture. Their bodies and teeth were more primitive

or archaic than those of the Neanderthal men, yet they must have been among the first artists, or else the first models for artists, for the earliest statuettes are found in soil of this date. These are small figures of ivory or soapstone, and some seem to have been modelled from people of a negroid race. They represent women, and modern scientists give each statuette the name of Venus, after the goddess of female beauty, with the name of the place of its discovery added—for example, the Venus of Brassempouy, the Venus of Willendorf, and so on.

It is a little difficult to believe that the Cro-Magnon people, who were an artistic race, so much admired the negroid Grimaldi folk that they turned to them for models rather than to their own women. It may be that the races intermingled, or perhaps artistic talent existed in both peoples, but chance has preserved the statuettes of the negroid Venuses and destroyed, or still keeps hid from us, the sculptured figures of Cro-Magnon beauties.

The woman and boy of the Grimaldi race were buried upright with their limbs bent and tightly bound to the body, perhaps with strips of hide or tight garments of skins. The cave where these skeletons were found is called the Children's Cave. There are in all nine caves at Grimaldi, and the others contain various remains of animals, and skeletons of people of Cro-Magnon race, which will be described presently.

In the cave of Paviland in South Wales, on the coast of Gower, there lay a skeleton painted all over with red ochre, and known for long as the 'Red Lady of Paviland.' She lay among the remains of food, bones of animals which had been eaten, charred

stones, and dust of the cave-floor. With her were found flint tools of the kind made by Cro-Magnons at this time. But the 'Red Lady of Paviland' had to give up her title, for when modern scientists examined the skeleton they found she was no ' Lady ' but a man of the Cro-Magnon race. We cannot help wondering who he was, this man who for long centuries had lain within sound of the sea on the cave-floor, his tools within reach, his coating of red ochre clothing him like a royal robe. Did his people lay him there in state when he died, and desert a country which had killed their lord ? No other skeletons of this age have as yet been found near, though they may be lying in their underground homes waiting to be discovered.

With our questions unanswered we must turn from the ' Red Lord,' so long called the ' Red Lady,' and go back to France and the Pyrenees to find out more about these interesting Cro-Magnon people.

CHAPTER XI

TWENTY-FIVE THOUSAND YEARS AGO

AS we have already said, the Cro-Magnon people probably came from Asia. There are traces of a civilization like theirs on the southern shore of the Mediterranean, but it is possible that this settlement was only a halt on the way from the East. Whether from Western Asia or from the Far East, here were these people overrunning Western Europe, and here they made up their minds to stay. It was a splendid hunting country, and though even the south of France was decidedly cold at this time there were plenty of convenient caves in which to live.

As time went on the Cro-Magnon people varied in personal appearance and in knowledge, much as Europeans vary to-day. This was partly due to their surroundings. If for several hundred years your ancestors have lived in the south of France you will not be very like a family which for the same length of time has lived in the forests of Germany. Then new peoples arrived from time to time and settled near, and intermarried; so, just as varieties arise in horses or dogs, man, though always man, varied slightly, though the shape and length of his bones may have been alike. Henceforward we do not learn so much from the differences in the bones of skeletons; it is to the tools and weapons that we

"IT WAS A SPLENDID HUNTING COUNTRY"

turn to find out about the lives of the early Europeans.

The Cro-Magnon race take their name, as we have seen, from a little cave discovered accidentally by workmen making a road in the valley of the Vézère. Here M. Lartet, a French scientist, found the skeleton of an old man, who has since been called the ' old man of Cro-Magnon.' He also found one of a woman ; poor creature, some one had dealt her a heavy blow on the forehead, for her skull still bore the mark of the wound. The bones of a child lay near her, and those of two young men. Flint tools were buried with them and perforated shells which had no doubt once been strung as necklaces, bracelets, and crowns.

Was the woman murdered ? Was she killed trying to protect her child ? Were the youths her brothers and the old man her father ? How we should like to know just what happened ! Bones cannot speak except to tell us by a study of their length and shape to what race the people belonged ; these bones are those of the new invading race.

On a spur of the Pyrenees, in Haute Garonne, a little grotto was discovered by chance by a labourer in 1852, before much was known about prehistory. This grotto was nearly full of bones, and at least seventeen people of all ages and of both sexes had been buried in this small cave of Aurignac. The mayor of the little town of Aurignac gave orders that the bones were to be collected and buried in the cemetery. Eight years later, when M. Lartet came to the grotto to examine it, not one human bone remained ; they were lost for ever, mingled with all the other bones in the cemetery. M. Lartet

found that on the terrace in front of the cave were the traces of a 'hearth' or fireplace, and in the soil near by a hundred flint tools and the bones of animals which lived at the same time as reindeer. What interested him most was to notice that the flint tools were different from those found with older skeletons.

There was a flint knife made of a flake struck off a lump of flint; one side was blunted so that it could be conveniently held in the hand, and the other side sharpened by striking off many tiny flakes. There were lance-points made of flint with the base split, perhaps to help in binding the point to a thong or wooden handle. A sort of stone chisel was also made; the people of this date seem to have liked small tools, for pigmy chisels and screw-drivers of flint are found.

Bone Pin and Needle

As tools of this particular workmanship were first discovered in this grotto of Aurignac they were called *Aurignacian*; and if you read of *Aurignacian culture* it means the skill possessed by the Cro-Magnon people who were living at the time those seventeen persons were buried in the grotto—the skill they used for making tools and contrivances for keeping themselves fed and clothed.

With this discovery at Aurignac we pass into what is called the *Upper Palæolithic Age*; henceforth there is much greater variety and skill in tool-making, and well-made tools are found only in the upper layers of soil laid down in palæolithic times. Into the Lower Palæolithic world of stunted people

with very rough tools had come a most intelligent, inventive race, who refused to work with a few stone disks and clumsy knives; they made screw-drivers, and chisels, and scrapers shaped like a parrot's beak, and realizing that flint would not make all the tools they needed they turned to bone, making awls and sceptres and lance-points from it, and, later on, bone needles and bodkins with extraordinary skill.

It is rather confusing to have people with such difficult names as Cro-Magnon and Aurignacian; but the Aurignacians were those Cro-Magnons who used tools such as were found in the cave of Aurignac. These Aurignacians spread from the borders of the Mediterranean over Syria and North Africa to Spain. Passing through France, they entered Southern and Middle Germany, and following the Danube reached Austria, Poland, and South Russia. They are thought to have lived between twenty-five and thirty thousand years ago.

CHAPTER XII

THE AURIGNACIANS, ENGRAVERS AND PAINTERS

LET us go back again to the shores of the Mediterranean and look once more at the people buried in the caves of Grimaldi, near Mentone.

There are Cro-Magnon children buried here, but their bodies were covered not with red ochre (such as was used in Wales and other places), but with an immense number of tiny pierced shells, which must have formed a burial cloak. A woman lies buried near, also in a mass of shells, but they were not pierced, and a few flint tools lay beside her. There was a man who had for pillow a large block of red stone; his arms were crossed on his chest and he wore a necklace and crown of pierced shells. Another man, whose body was found under heavy stones, placed to protect him from any disturbance, wore a crown of shells coloured red, and tools of different kinds were laid on his forehead and chest.

It is quite likely that these people painted their bodies with red ochre when they were alive, since when we study their art on the walls of their caves we find how much they loved colour. So no doubt when we find their dead buried in a coating of ochre we may suppose that they were merely being prepared for a new life in which they would wish to make a brave show, with their finest shell ornaments, their best tools, and their bodies painted a gay red.

The Aurignacians had plenty of invention, and liked to make new kinds of weapons and tools. They had

Stone 'Notebooks'

a great love of engraving, a taste which we shall find more pronounced in another later race of people, and they made quantities of flint 'points' for this purpose, using them for drawing just as we should use a pencil. These points were straight or curved, and of all sizes.

There were no such things as paper or parchment, so the artists of those days used the bones of reindeer on which to cut their designs. Otherwise they employed the ivory from the tusks of elephants, or a soft kind of stone called soapstone, or the walls of their limestone caves, as canvases for their pictures. Tools of great strength and sharpness were needed when they began to make statuettes and cave-wall paintings, and there must have been many trials and false starts before the right tool for each new branch of art was discovered.

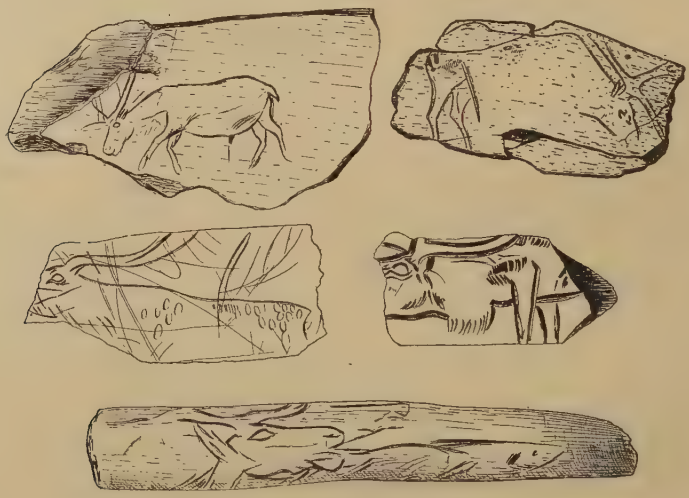
The Aurignacians were a roaming race, and like all travellers who meet strange peoples and customs they copied the ideas and inventions of other folk and adapted them to their own ends, and thus became very clever themselves. We do not know much about the other races whom they would meet on their travels, except the negroid race living as the Aurignacians did along the shores of the Mediterranean, and the Neanderthal people whom they drove away, seizing their hunting-grounds and cave-homes. Still, no doubt there were other differing peoples whom they met on their journeys.

Once established in their cave-homes, they began to adorn the walls with engravings and paintings.

You will want to know how we are certain that these decorations were the work of the Aurignacians and not of some other race of artists living at another date in the centuries and thousands of years separating us from the Aurignacian age. When it comes to dates and reckoning there is no way but to go back to the Earth and try to coax it to tell us the secret.

In four of the caves the wall-paintings were quite buried under earth. One cave, when the soil was

removed, was found to contain tools such as were made by the Aurignacians, and they were lying among the bones of mammoth, lion, rhinoceros, bison, and reindeer. So it is evident that the paintings were made by the people who threw down



Sketches

their broken or discarded tools on the floor with the bones of the animals they ate, until the rubbish mounted so high that the work of their artists was covered and forgotten.

In other cases there has been a fall of rock or a landslide, blocking entirely the mouth of the cavern, which remained undiscovered till recent days, when scientists on the look-out for these secret painted halls came by chance, or by lucky excavation, on the buried opening.

The cave of Niaux on the Ariège river was pro-

tected from intruders by a lake six feet deep and several hundred feet long, which people did not think of crossing. In some of the caves the paintings and engravings were made one on top of the other, and since those done by the Aurignacians are always underneath those done by other races we know that they were the earliest artists.

Yet another proof that this art dates from these times is that fragments of bone or stone are found in the soil of Aurignacian days on which are cut sketches for the pictures which decorate the walls. Like all artists, these people made a rough sketch before they embarked on a big picture; it brings us very near to our distant ancestors to find these 'note-books' of theirs with the head of a horse, a reindeer, or some other animal, thrown down on the floor when the real picture was completed on the wall above.

On the floor of the cave we may find the stone bowls in which the artists ground their colours, the split bones, stopped up at one end, in which they kept them (their paint-tubes), the bone palettes on which they mixed them, and the remains of the colours—red and yellow oxides of iron, and black from manganese ore.

Sometimes when the paintings were a long way inside the caves it must have been impossible to paint by daylight, and we find the stone lamps the artists used. The Eskimos use the same sort of lamps to-day, with wicks of moss rubbed very fine, for both lighting and heating their houses, and when well tended the lamps do not smoke. The cave-bear and mammoth would provide plenty of fat for oil, as would the marrow-bones of bison, reindeer, and horse.

CHAPTER XIII

THE WARRIOR SOLUTREANS

FAR older than the pictures of animals on the walls of the cave-houses was another form of decoration, which required no real artistic talent. This consisted of drawings of human hands. They were mostly painted in red. Either the hand was placed on the wall and paint smeared round it, or it was dipped in red ochre and applied to the wall. Modern primitive people fill their mouths with colouring matter and squirt it round the outspread hand. The curious thing about these hands is that in many cases they lack a joint on one or several fingers. Savage peoples have to this day a habit of cutting off the joint of a finger to appease their gods. This may have been the custom in Aurignacian as in later times.

At Laussel, in the Dordogne, Dr Lalanne found two bas-reliefs, one of a woman and the other of a man. The woman is cut on a block of limestone; her whole body is polished except her head, and once she was painted red. She holds the horn of a bison in her right hand and turns her head away. Her face is not represented in detail. Perhaps she was pouring out a libation to her gods. The man is hunting, either drawing a bow or throwing a spear; unfortunately the top of his head and lower part of his legs have broken away, and his arms are missing.

The correct motions of a trotting horse as revealed by the cinematograph make us realize how very clever the cave-men were in drawing pictures such as this.

THE WARRIOR SOLUTREANS

The Aurignacian artist-people in time, like all their forerunners and descendants, had to fight for their existence and homes. Another people was working its way through Hungary and along the Danube, a people whom we know as the *Solutreans*. These new folk had no great artistic talent; mentally and in physique they were inferior to the Aurignacians. They had, nevertheless, one gift—great skill in making flint spear-heads and lances by means of a peculiar blow on the flint, the result of which has been called the 'Solutrean retouch.' This race, with the trick of making perfect spear-heads, who cared for war and not for beauty, came westward from Hungary, intent on hunting and conquest.

The climate was cold and dry, reindeer was still the most common animal in France, and reindeer-

An Ancestor of the Horse

meat was the principal food of the Solutreans, for near the river Saône at Solutré (the place from which these people take their name) quantities of reindeer bones are found.

Solutré was the site of a very large open-air camp, facing south, and sheltered from the north by a high ridge of rock. The Aurignacians had seen the

advantages of the situation, and had had a camp there too, from which they had hunted wild horses for food. An enormous number of horse skeletons were found at Solutré in soil of Aurignacian age; it is said that there were the remains of more than a hundred thousand horses of from five to seven years old. No one had thought of taming or harnessing a horse in those days, so these horses must have been merely for food. Under the horses' bones were yet more reindeer bones, which must have been left by the Aurignacians.

On the remains of this immense larder the Solutreans established their camp, and built great fireplaces, and we find the remains of plentiful feasts. Near by was a good spring of water. Here we find their wonderful weapons, the lance-heads like willow-leaves, and the 'laurel-leaf' spear-heads chipped and flaked on both sides, as well as those worked only on one face. Later on the Solutreans invented what is called a 'shouldered point,' or rather they did not invent it, but copied and improved on a somewhat rougher tool which the Aurignacians had made. It was a dart, slender and notched on both sides, so that once in the flesh it remained sticking there. Some of these darts had a shaft so that they could be fixed to a thong or wooden spear. A great many curious sceptres or arrow-straighteners were made out of reindeer-horn, the precise use of which we cannot decide. Occasionally the Solutreans made javelin-points of bone.

A 'Laurel-leaf' Flint Spear-head

It is not exact to say they had no art, for some curious animal statuettes were discovered in their camps, such as two reindeer in stone at Solutré, and at Predmost in Moravia the statuette of a mammoth sculptured in ivory, measuring about four and a half inches, and covered with fine lines to represent the hairy coat.

The Solutrean people do not seem to have been very numerous, and they appear to have kept to the coast-line of France, going as far as Santander in the north of Spain, and not turning aside into the Pyrenees. So though their marvellous spear-heads and lance-heads gave them an advantage in battle and the chase, the Aurignacians could seek safety in flight to the mountains.

The Aurignacians never spread very far east in Europe, and it may be that the Solutreans were a branch of the old Mousterian folk, drawn westward for a time by the roving spirit, to rule part of an alien people, and holding rather the same position as that of the British in Egypt in modern days. Their domination did not last long in the west of Europe. There came a day when these makers of deadly weapons were driven out by yet another new race, the *Magdalenians*, who were as clumsy as the Solutreans were clever in working flint. So even fine weapons and a people with a genius for war were as nothing before that strange Fate which decrees perpetual change.

The day of the Solutreans was over.

CHAPTER XIV

THE MAGDALENIAN ARTISTS

IT is thought that the Magdalenians made their appearance in Western Europe about 16,000 B.C. These newcomers had no connexion with the Solutreans, but in their artistic talent more resembled the Aurignacians.

The Magdalenians were very careless about tool-making; they seemed not to have cared if their flint was good or bad, and not to have troubled that their workmanship of it was inferior.

It is thought that these new invaders came from the extreme north-east of Europe, or from whatever corner of North-eastern Europe was habitable at that time. We know they did not come from the south, for the shores of the Mediterranean show no trace of them.

The three peoples, Aurignacian, Solutrean, and Magdalenian, were all branches (though with varying traits) of the Cro-Magnon race. The Magdalenians, who were so careless about their flint tools, became very skilful in the working of bone, and their javelin-points were made of this material. It seems curious that the fine workmanship of the Solutreans in flint should so abruptly have come to an end and been forgotten. In explanation it has been suggested that this may have been the time when bows and arrows first came into use. Some of the paintings

of animals on the cave-walls of this date have arrows painted on their flanks. It is thought that this was done in the hope that a real wound might be inflicted in the spot where the artist showed his weapons taking effect.

A Mimic Wound

The Magdalenians must have been keen fishermen, for they invented the earliest harpoons made of bone. To begin with, these harpoons were merely straight pieces of bone with notches cut into one side. The notches were later developed into teeth, first on one side and then on both sides of the harpoon.

Western Europe was in the grip of great cold again. The Swiss glaciers were 2700 feet nearer the plains than they are to-day, and the Alpine animals

had been driven down from their mountain homes. There was an extraordinary variety of animals seeking for food on the plain at this time. The great mammoth still browsed on the leaves of thyme and crowfoot, which seem so small for such a huge creature to eat. The reindeer, stag, and wild horse were joined by the chamois, and the bison stalked among the smaller creatures of the meadows. There was even an occasional lion to be seen. The wild ass had come from Asia. Brown bears shambled through the forests, cave-bears sharpened their claws on the cave-walls or disputed possession of the caves with Magdalenian men. Tree-squirrels appear for the first time. Hares were to be found in France, and beavers built their dams in the rivers where fish were plentiful. As for birds, there were grouse, ptarmigan, ravens, whistling swans, and other northern birds.

HARPOONS MADE OF BONE

In this cold climate the Magdalenians were forced back to the caves which the Solutreans in other days had almost abandoned for open camps. During the warmest days of summer the Magdalenians probably also lived in open camps, but we have a very definite proof that the caves were their winter homes, for there, among the bones of other animals brought in for food, we find the remains of deer which had shed their horns. Now deer shed their horns between November and February, so we know that at least between those months man

HIND AND SMALL BLACK BISON, FROM THE CAVE OF ALTAMIRA, SPAIN

sheltered in caves. Thus driven back to the half-lights and the mysteries of shadows, with plenty of game near at hand when the weather was suitable for hunting, the Magdalenian people found relief from cave gloom in the land of imagination, and decorated the walls of their homes with paintings which are the wonder and admiration of artists to-day.

The Magdalenians are called after a great rock-shelter lived in by their race, La Madeleine. Limestone rock overhangs a platform about fifty feet long on the right bank of the river Vézère. As there was no cave these people must have erected skin tents, and bison and reindeer roaming the river-banks would provide them with plenty of meat. There would be ample opportunity for trying their skill with harpoons in catching fish.

The level of their oldest camp is below the present level of the Vézère, which shows that then, as now, the site of the camp was occasionally flooded, when they would have to seek shelter elsewhere till the waters subsided. In this camp were found stone bowls in which the mineral colours used in wall-painting or tattooing were pounded; an ivory tusk engraved with a woolly mammoth in the act of charging; the bones of horses, reindeer, and bison; and harpoons with a single row of barbs or teeth.

La Madeleine was not by any means the biggest camp the Magdalenians had, but it was one in which were found all the special kinds of tools and utensils which marked them out from the people who came before and after them. There was a varied collection of engraving tools, many very small and dainty, which were necessary for the fine engravings with

which they were to astound humanity. There were javelin-points of bone or reindeer-horn, delicate bone needles and bodkins, small staves of bone or ivory richly decorated with engraving, borers with which to pierce the eyes of their needles, and thin bone plates frequently ornamented with varying designs, which may have been worn as pendants. Even the bone chisels of that age were often decorated. The great love of art shown by the Magdalenians seemed to urge them to beautify everything around them. The numerous scrapers and the fine bone needles show that they paid more attention to the making of their skin garments. Elaborately carved brooches, which they must have worn, have been found. All their skill seems to have been devoted to bone tools or graving tools; their other flint implements were far rougher than those made by the Aurignacians, and have no chance of comparison with the beautiful ones made by the Solutreans.

CARVED HORSES ON REINDEER-HORN

We know of three great changes in the climate in Magdalenian times. At first it was so cold that there was a great advance of the glaciers of the Alps, Scandinavia, and Great Britain. We can trace on the south side of the lake of Lucerne new moraines formed at this date, showing how the ice was at work. There was a great sinking of the land near the coast in Great Britain. Scotland was so cold that Arctic plants were found to within a hundred and fifty feet of sea-level. This was the time when the Mag-

dalenians established themselves in their caves and turned their attention to house decoration and the ornamentation of their bone tools and lance-points.

The bitter cold was as usual succeeded by a dry period of icy winds and dust storms, and the animals which were lovers of plains, the wild horse, antelope, jerboa, wild ass, reindeer, and lemming, all made their appearance in Western Europe. The lemming is a small animal rather like a rat, which will only live in cold, dry lands, and in fact is so fussy about the temperature that it is a very good climate thermometer.

With frequent dust storms in summer, and both dust and snow storms in winter, Europe cannot have been a pleasant place to live in. No wonder that men had given up the free, gipsy life of open hunting-camps, and turned from the dust-ruled outer world, where the majority of animals were neutral-tinted, to paint on their cave-walls in red and every shade of orange and yellow the animals they most admired—the bison, which came with the fresh grass, the mammoth, which was growing scarce, the wild cattle heralding the return of summer, and so on. They made harpoons of reindeer-horn with very short teeth cut out on one side.

When the cold grew less, and the climate was once more moist, a greater variety of animals was seen than Europe has known before or since. They came from the plains of Western Asia as well as from those of Eastern Europe. I suppose it was hunger which drove them westward through Europe, and the Magdalenian artists standing in their cave-entrances must have watched an endless procession of unconscious models posing for them.

The third change in climate came with the last great effort of the icefields to rule Europe. It was an effort which failed, and with this final defeat the days of temperate climate triumphed. The reindeer and the animals of the ' steppes ' and Arctic regions emigrated, and the Europe which we know, the Europe of moderate heat and cold, peopled with the animals of our day, came into being.

At this point we stand on the threshold of the great development of man and his intellect. The battles royal between the sun and ice are fought, and as in most fights neither side is completely victorious ; as if exhausted, these two elemental forces stand watching. The animals which once terrorized the man of Neanderthal times are reduced to the second place ; and man the toiler and fighter, still stumbling and struggling, but gifted with a divine curiosity, is henceforth the central figure on the stage, growing to think that his hands hold the controlling levers.

Let us turn to the artists and their work, to the men who first thought of adding to the beauty of the world.

CHAPTER XV

A LITTLE GIRL'S DISCOVERY, AND THE HORSE-SCULPTOR

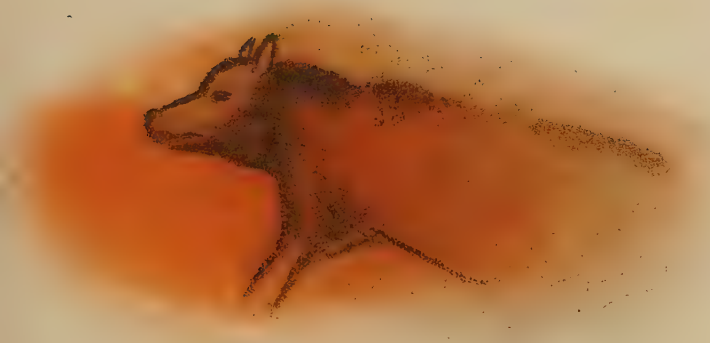
IT is to a little girl five years old that we owe the discovery of one of the most beautiful painted caves, that of Altamira in North Spain. The entrance had been found by a huntsman when he was digging out a fox which his dog had chased into the cave. The Marquis de Sautuola, a Spanish gentleman interested in antiquities, knowing of the existence of this cave on the downs above Santillana del Mar, set out to search in it for any remains of interest. He took with him candles, digging tools, and his little five-year-old daughter. After a time the child grew tired of watching her father dig. Being small, she could easily move about where the roof was too low for the Marquis to stand upright. Suddenly she called out, "Bulls! bulls!" Her father found her pointing up at the ceiling, which was covered with paintings of animals, some of them being more than five feet long. Here were painted bison, stags, hinds, horses, and wild oxen, also pigs and wolves, adorning the long gallery as well as the ceiling of the cave where the little girl discovered them. There are engravings here besides paintings, and the walls show the scratches made by cave-bears when sharpening their claws.

When the Marquis told of these paintings more than forty years ago, and said they must be of incredible age, everyone laughed at him. Such skill in painting, the critics said, must be of fairly recent date. It was too like a fairy story that a child of five should find a painted palace of long-dead people under the grassy downs in the north of Spain.

During the last forty years men have learnt a great deal, and have realized that they have a long way to go before they come to the end of their discoveries. Though there is little of the Earth's surface which man's foot has not trod there are realms of unguessed wonders waiting for his investigation, and it may be some little child at play who will push open for him a forgotten gate.

Underneath the earth are these painted halls and galleries reminding us how quickly man forgets—forgets his skill, his art, his kings, his temples, and his gods. We long to know of what strange scenes these painted animals on the ceiling of Altamira were spectators; but for us it is all guesswork till the day when the little Spanish girl trotted into the cave with her candle in 1879.

Was this cave of Altamira a palace? Or was it a temple? Perhaps it was both, and the chief priest may have been the king. The story-teller of the early cave-dwellers, who wove strange tales to explain the death of loved ones, became the priest, since he seemed to know more of the unseen world than his hearers. When illness threatened he tried simple remedies, and learning by experience the uses of herbs he became the medicine-man of the tribe. These medicine-men passed on their little store of knowledge from generation to generation,



WOLF, FROM THE CAVE OF FONT-DE-GAUME, FRANCE

WILD BOAR, TROTTING, FROM THE CAVE OF ALTAMIRA, SPAIN

and as their skill increased they were more and more respected and feared. At last they were supposed to hold the power of life and death in their hands, and as in the great days of monarchies kings have power over the lives of their subjects, so among savage peoples it is difficult to divide the rule of kings from that of medicine-men priests.

Most people pray for fortunate things to happen in their daily life, and when success in hunting meant assured personal comfort no doubt the Magdalenian folk went to their medicine-man priest to ask him to pray to the gods to give them good luck in hunting. He would tell the artists to paint the portraits of the animals they wished to kill on the walls and ceilings of the cave. The artists set to work, and often painted the creature pierced with arrows, feeling that the capture was half accomplished when the painted animal, mortally wounded, glowed in red and orange on the wall.

The artists of these days carved as well as painted. There is a rock-shelter called Cap Blanc under an overhanging limestone cliff on the sunny side of the valley of the Beune, a small stream which is a tributary of the Vézère. On the back wall of this shelter is carved a wonderful frieze of horses, of a type not unlike the Arab horse of to-day. Six horses are cut out of the limestone, each of the animals being about seven feet long. There are also some bison and oxen, but these are not so well carved. The frieze was buried under a layer of earth and clay, and it was not till this was cleared away that the sculpture was discovered.

In this earth were found tools suitable for carving the animals of the frieze, as well as the skeleton of a

man of the Magdalenian type. Perhaps it is the artist himself who lies at the foot of his works of art, his tools round him. How he must have lain concealed watching his models as they raced on the uplands, or passed down through the woods to drink! Horse-flesh was very likely his chief meat, and the instincts of artist and hunter must often have warred in his breast. It is most likely that he was also a medicine-man.

The sculptured horses looked down for a time on the tools which carved them and the bones of their creator, and then the irresistible, smothering earth buried them too, till the spade of the explorer revealed them once more after thousands of years.

CHAPTER XVI

STRANGE PAINTED CAVES

IT was not only the walls of caves which were illustrated with carvings and engravings. Limestone is porous, and the water dribbling through the rock brings with it a deposit of lime. If the dropping comes from the roof and is extremely slow the lime deposit remains attached to the ceiling of the cave and forms pendants, sometimes of strangely beautiful shape. If there is too much filtering, and the water splashes from the roof down on to the floor, a lime deposit will be formed there, sometimes rising till it meets a pendant hanging above. The hanging growth from the roof is called *stalactite*, and that on the floor of the cave *stalagmite*. In many cases the early artists engraved animals on these lime deposits, adapting their design to the shape of their curious ' canvas.'

In 1912 a strange cave called the Tuc d'Audoubert was discovered in the Pyrenees by Count Begouen and his sons. A river issues from the mouth, so that a boat must be used for the first eighty yards ; then a scrambling climb leads the explorer into a hall hung with lovely white stalactites. A narrow passage leads out of this hall, boasting fine engravings of bison, reindeer, and horse. The explorer eventually finds himself in a damp cave with a clay floor. This cave was evidently once the haunt of cave-bears,

for many bear skeletons were found here, and the imprints of paws remain on the clay floor; the walls also show traces of the sharpening of claws. An engraving tool, a scraper, and some flaked flints, all of the Magdalenian age, were picked up near by.

SORCERER

Man wearing antlers, mask, beard, and tail, probably for some magic rite.

Almost at the end of the cave, leaning against a rock, are two clay statues of bison. The dampness of the cave has prevented them crumbling away centuries ago, but an earth tremor or an unusually dry season has cracked both bison across. There is a hollow near, from which lumps of clay were taken to model the statues. Round a little clay mound are marks as if some one had danced round on his

heels. The artist had sketched two more bison on the floor, but had only started modelling one of them. We cannot help wondering if a cave-bear cut short his artistic efforts, or whether he went off to look at a bison grazing in the valley, and, returning, found a fall of rock had sealed up the entrance to his studio.

In a cave near the Tuc d'Audoubert, called the cave of the Three Brothers (Trois Frères), because it was discovered by the three sons of Count Begouen, is a weird painting of a man with horns and a tail. The horns are those of a stag. This man is painted at a height of twelve feet from the floor, and looks down on an alcove decorated with engravings of bison, rhinoceros, reindeer, mammoth, bear, and other animals. The masks of lions guard the entrance to the big apse at the end of the cave.

Once again we ask, was this cave a temple ? Were the engraved animals offerings to please this terrifying creature with horns ? Was he a god ? Or did the high priest at great feasts appear before the people like this, wearing the mask of a stag and a tail ? Have the old fables of beings half animal, half human, some truth in them ? It is easy to see that the pictures of awesome devils in the medieval books had a long ancestry.

If I told you of all the caves which the Magdalenian artists decorated this chapter would never be finished. There is a fascinating procession of mammoths on the left wall of the great picture-gallery of Font-de-Gaume, and an equally fine procession of bison and reindeer. No less than eighty animals are painted in the gallery of frescoes in this cave.

Then there is Niaux, with its underground lake,

its passages as big as a railway-tunnel, one with a wounded ox engraved on the floor, and another with an engraved fish, leading to an apse decorated with marvellous black paintings. This cave goes for half a mile into the mountain. It is at Niaux that we first see paintings of animals pierced by arrows, which are carefully drawn with feathered heads.

The artists had now become much more elaborate in their methods of painting. They engraved the

"One on top of the other"

outline of the animal with a sharp flint, and planed the borders of the design so as to make the creature stand out more. Then a black line was painted round the outline, followed by a line in red, and the hairiest parts of the animal were painted in brown. The final details of eyes, horns, and hoofs were added later. If no daylight has penetrated the cave the colours are as fresh as if the artist had just completed his work.

In many instances the animals are drawn one on top of the other, and even upside down, so that

a mammoth is half eclipsed by a reindeer, or the hind hoofs of a pony tread the shoulders of a cave-bear, whilst a reindeer seems suspended by two hoofs from the pony's neck.

The statuette of a little horse carved on a piece of mammoth-tusk was found near Lourdes in France, and also the head of a horse carved on a reindeer antler. They are both masterpieces, but have nothing in common with the rock-engravings of which we have been speaking.

The Magdalenians carved their dart-throwers with animals such as ibex or antelope, and tried their hands at human statuettes in bone or ivory, following the lead of the Aurignacians, though like them they bestowed very little care on the representation of the features. This may have been from a belief that it was unlucky to portray the human face too exactly, an idea which still exists in some parts of the world to-day.

The Magdalenians were more inclined to roam northward than southward. They seem to have avoided Italy, but passed through France to Belgium, England, Switzerland, Germany, and Austria, and they even reached Poland. Wherever they went they left their particular tools—their harpoons, shell ornaments, lances, decorative patterns on bone, dainty needles, and (a special development of their later days) pygmy tools in flint.

In Spain the Magdalenians do not seem to have gone far south, for the traces of their civilization are only found north of the Cordillera Cantabrica.

In the layers of soil of early Magdalenian age little bone animals cut out of thin plates of bone are sometimes found. The bone was too thin for

sculpture, and so the artists used it for cutting out animal silhouettes. Nowadays people wear little ivory elephants, lucky pigs, and black cats slung round their necks as mascots, and perhaps these bone animals served the same purpose. There was also a fashion for bone disks with a hole in the centre, from which radiate engraved rays. Fashions in ornaments had begun and were almost as fleeting as our fashions are. These varieties in taste are a great help to us in dating the different phases of the long Magdalenian age.

CHAPTER XVII

THE AZILIANS AND THE NESTS OF SKULLS

THE time came when this race of great Magdalenian artists began to decline. They rose to their highest point at a time when the climate was cold and dry; but when, in the course of centuries, the climate grew once more cold and wet the Magdalenians began to disappear.

Forests again covered Europe; the mammoth and the reindeer left the south-western part, and perhaps the artists of the caves followed them, preferring plains and uplands to forests. Reindeer and horses had provided the Magdalenians with most of their food and clothing, and supplied them with bone for their tools. Some horses of a forest-loving kind lingered in Western Europe, but the horse of the wide, sand-blown plains migrated to a drier land.

The Cro-Magnon races of hunters were nearing their end. We can still trace the type—broad faces and narrow heads—in some parts of France, in the islands of North Holland, and in one place in Scandinavia, as well as perhaps in the original inhabitants of the Canary Islands. But nowadays they only exist as curious survivals.

The Cro-Magnon peoples, with all the wealth of invention and art which they brought to the world, pass out as mysteriously as they once suddenly burst

on to the stage of history. In their stead comes the race of Fishers.

The Fishers made it a very different world. They cared nothing for art, they neither engraved nor sculptured, and their painting was limited to some daubs of colour on pebbles, or a few weak conventional designs. It would be interesting to inquire if races whose main food is meat are more artistic than those living chiefly on fish and roots.

The Fishers made no bone tools except harpoons and some polishers, and even these they made very roughly. Their painted pebbles may have had some significance which is not apparent to us, as in a cave at Birseck a heap of pebbles was found with each stone carefully broken across. It is not likely that the pebbles were used as money, since the style of their decoration was so simple that they would not be difficult to copy.

Several new races were pressing into Europe at this time, as can be seen from a study of the different head-shapes in burials of this age. There was a broad-headed race and one with very long heads. The Cro-Magnons had long heads but broad faces, whereas this new long-headed race had narrow faces. There was one race with a certain art, the Maglemose people. They may have been a branch of the Magdalenian stock, but they did not come from Western Europe; they made their appearance in Scandinavia soon after the ice cleared away. Two harpoons made by the Maglemose people were lately found at Holderness in Yorkshire under the peat. They are the first relics found in England of this race, and date from between 10,000 and 12,000 B.C.

The Fishers made Harpoons of Bone and Reindeer-horn

There was yet another race living on the shores of the Baltic, as well as a people who came from North Africa and made specially tiny flint tools, a great number of which were found at Fère-en-Tardenois, in the Aisne department of France. From this fact the manufacture of tiny flint tools is referred to as the *Tardenoisean* industry. It is probable that the small triangular flints found were originally fixed in a wooden or bone frame to form the teeth of a harpoon.

One of the best places to study the tools of this new people, or mixture of races, is the Mas d'Azil, about forty miles from Toulouse. Here the river and the highroad alike cut their way through a tunnel for a quarter of a mile. In the soil on the bank of the river Arise in this tunnel M. Piette, a French scientist, found more than a thousand harpoons with barbs on either side, and made of stag-horn. Now the Magdalenian harpoons were of reindeer-horn, and some of these were found in a lower level of earth than that in which the stag-horn harpoons were discovered. M. Piette, recognizing that the double-barbed stag-horn harpoons were the work of a more modern race than those made of reindeer-horn, called their makers *Azilians* from this find in the Mas d'Azil.

All the names — Mousterian, Aurignacian, Solutrean, Magdalenian, Azilian—are only labels which we moderns have given these races to remind ourselves of the places where their principal treasures were discovered. They no doubt had names of their own for different nations and tribes, but as we do not know even a word of any of their languages we are forced to invent our own names for them.

There is an interesting burial of Azilian people in a cave at Ofnet in Bavaria. It is interesting because instead of complete skeletons there are only skulls, and these are arranged in nests, twenty-seven in one nest and six in the other. The skulls point westward, and, instead of facing the entrance of the cave as was usual in burials of earlier date, they face the wall. They include skulls of people of all ages, but mostly those of women, children, and youths, and the mixture of races is shown in the variety of the shape of the skulls. Necklaces of teeth and shells are buried with them, and the skulls are embedded in red ochre. Flint tools are laid beside them. There were no traces of home life in the cave, which must have been used only as a tomb.

There is nothing to explain why these people were beheaded and yet buried with their ornaments and weapons, but we can be sure that with the blending of the various races, the square heads and the long heads, the broad faces and narrow faces, went also a reconsideration of ideas on life and death, on religion and tool-making, on art and occupation.

The so-called Palæolithic or Old Stone Age, the time of chipped flint tools, passes away, and the Neolithic or New Stone Age is born—the time of polished stone tools, of the discovery of agriculture, the taming of animals, and the making of pottery.

Our studies lead us into quite a different world, and into a society with a greater wish for companionship. The days of man the lonely, wandering hunter are past.

CHAPTER XVIII

THE NEOLITHIC PEOPLE

THE Neolithic people made the life of the hunter-folk impossible, for they brought with them various valuable discoveries, the greatest of which was a knowledge of agriculture. How, where, or when man first thought of collecting seed and sowing crops we do not know, though we know the discovery must have been made in Asia; but the people who now took possession of Western Europe had that knowledge. They also brought the greatest animal-friend man has, the dog, without whose help the keeping of flocks and herds is impossible. And they made rough pottery, cooking-pots, bowls, cups, etc., all by hand.

You can see at once that a people who sowed fields of grain, and had flocks and herds to pasture, would have nothing in common with hunters pursuing their quarry hot-foot across the country. The wild animals, driven off by dogs from the flocks of sheep and herds of cattle, and by men from the cornfields, moved farther and farther away, forcing the hunters to follow them.

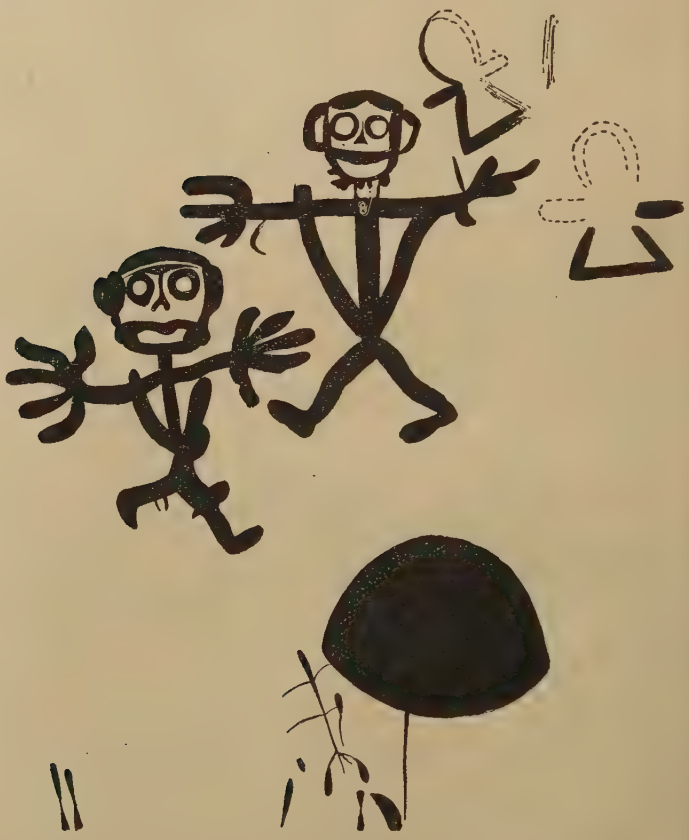
One of the great differences between a people who are shepherds and farmers and a hunting-race is that so many more persons can live in an agricultural country. The best-stocked hunting-ground can only provide food for a few families all the year round; but

with sheep, cattle, and corn a far larger population can be supported. Then men began to select special work; some were shepherds, some cattle-men, some farmers and labourers, unlike the old-time hunter who had to be universal provider of food and clothing for his family, defend them and himself, and find and furnish his house.

Spanish Paintings of Ibex, Oxen, and Horses

In time the cattle-men and shepherds fell out with the farmers and labourers, for the former would have liked to pasture their flocks and herds on the cultivated fields of the latter. When a neighbouring tribe whose harvest had failed, or whose flocks and herds were attacked by disease, came to raid to make good their losses, or when the shepherds and cattle-men, finding insufficient pasture, drove down their charges on to the arable

land, a certain number of able-bodied men were sent to drive the robbers away; this was the

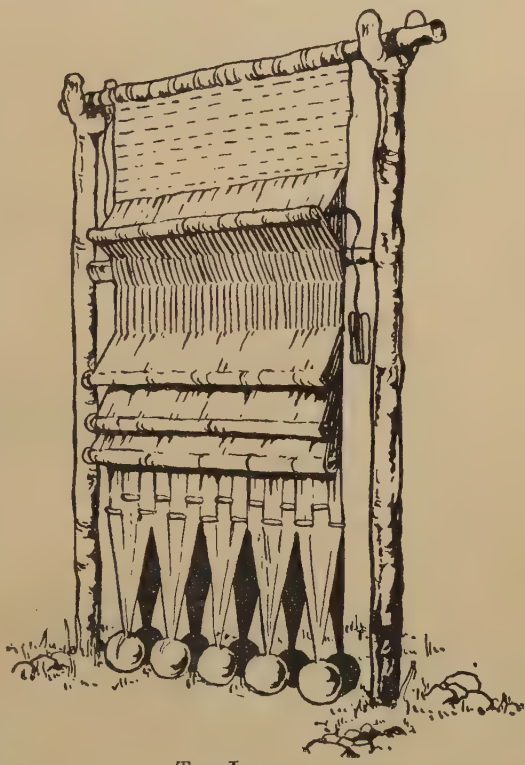


Funny Little Men from Cave-wall Paintings in Spain

beginning of an army of men trained to defend their tribe.

Now that they were able to specialize in work and choose a profession, instead of being jacks-of-all-

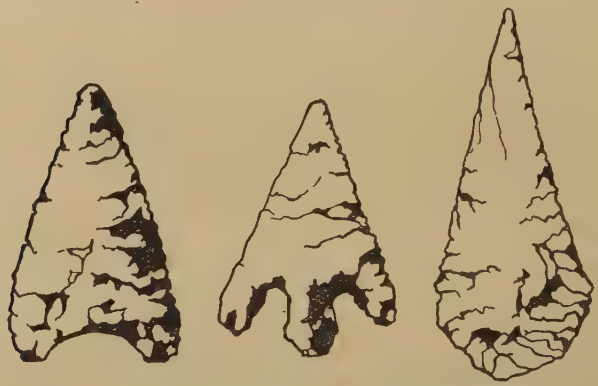
trades, men became more particular and more ingenious in building their houses. A great many chose to make an artificial island near the shores of a lake, build a wooden house, and connect it with the mainland by a causeway. Sometimes they had no island, but merely built on wooden piles. A causeway could be easily defended in case of attack, and, if necessary, fishing could be resorted to without leaving the house. All the rubbish was tipped into the water, and in searching these rubbish-heaps to-day in places where the water has retreated we find out what shell-fish and animals these people ate, and other domestic details. As a rule several houses were built close together, forming little villages. If there was no lake or marsh the wooden houses were clustered in some clearing of the forest, and entrenchments dug round them, so that an enemy had to cross



THE LOOM

several deep ditches before reaching the houses. In some cases the houses were underground, and were thus easier to defend, though they cannot have been very pleasant to live in.

The clothes of these people were more elaborate; they grew flax and wove it into a sort of cloth, as well as using the skins of animals. Their weapons



Neolithic Arrow-heads and Lance-head

and tools were still of stone, but, instead of being roughly chipped, some of these were polished, the stone was selected with care, and as men's skill developed the workmanship became finer; till at last the discovery first of copper, then of bronze was made, and arms and tools were fashioned of both.

These new people had different ideas about burying their dead. In many cases the caves and grottoes which had served the former races as houses were used by the Neolithic people as tombs. They also buried in the open, and erected enormous and imposing monuments over the graves. This

is the meaning of many of the so-called 'standing-stones,' blocks of stone standing even now lonely, or in small clusters, often in the midst of fields. The graves were sometimes lined with big slabs, fitting tightly at the corners and with a stone 'lid' on the top, forming a kind of chest. A collec-

A Dolmen

tion of these stone 'cists' had occasionally a passage connecting them, like a corridor between rooms, and we call them (using a French term) *allées couvertes*. Another kind of monument which the Neolithic people built is called a 'dolmen'; at its simplest it consists of three, four, or five stone supports covered by a cap-stone or table. These may have marked the graves of important people, or, in their most elaborate form, such as at Stonehenge, or at Carnac in Brittany, were perhaps temples.

It seems as if one of the great differences between

the Neolithic and the older races was a passion for companionship. Village life succeeded the life of roaming hunters and fishers, the crouching in grottoes, or at the best a few score persons herding

Neolithic Man with Spear

in a cavern. Perhaps they felt that even in death this love of company might survive, and so a passage was made connecting the underground tombs. With the first village-dwellers a long stride forward was made in the development of civilization; hence-forward the road leads straight onward, from the village to the castle, from the castle and town to the nation.

CHAPTER XIX

LAKE-VILLAGES

SWITZERLAND is the country in which it is easiest to study lake-villages. Many remains of them are to be found on the shores of Lake Constance, as well as on those of Zürich, Geneva, and some of the smaller lakes.

A Lake-village

The lake-dwellers must often have suffered from hunger, for there are usually more bones of wild animals than of domesticated ones in the rubbish-heaps under their houses. The remains of martens, polecats, and foxes may only mean that these were

killed for their fur, or they may have served to replenish the larder when other meat was scarce. Foxes were smaller in those days than now, as were sheep, and there seems to have been only one breed of dog.

The bones of hares are very seldom found, but this may be owing to the strange prejudice against eating the flesh of this animal which still exists among some peoples. Laplanders, Jews, some Arabs, and the ancient Britons have all refused to eat it. Though there were rats and mice there were no cats in the Swiss lake-villages. There were nuts and apples and cherries for the children of those days, peas, and (what many modern children dislike) parsnips.

The cups were of wood, and were really small bowls with no handles; the pottery plates, jars, and basins were roughly ornamented with designs drawn in the clay with a finger-nail. Occasionally we find a horn drinking-cup.

As the rubbish is found all over the space below the lake-dwellings we think there must have been many gaps between the planks of the floor; so, when a bone hairpin slipped from a woman's hair, or when she dropped her bone needle in the midst of making and mending for her family, down it went into the water to join the bones of whatever beast had formed the family dinner, the old oyster-shells, the cherry-stones, the broken harpoons, and the rest of the family refuse.

The huts had wooden rafters, the crevices between them being filled with clay.

An interesting lake-village was discovered on the north side of the Lake of Bienne. It was of considerable size and joined to the mainland by eight

bridges. The village had evidently been burnt. Among the tools found there were many made of stone such as jade and nephrite. Nephrite is an

Pottery

interesting stone akin to jade, but of very variable colour. It can be white, rusty red, yellow-green, or black, and is usually transparent. Quantities of it are found in Alaska and Central Asia, and a certain amount in Silesia.

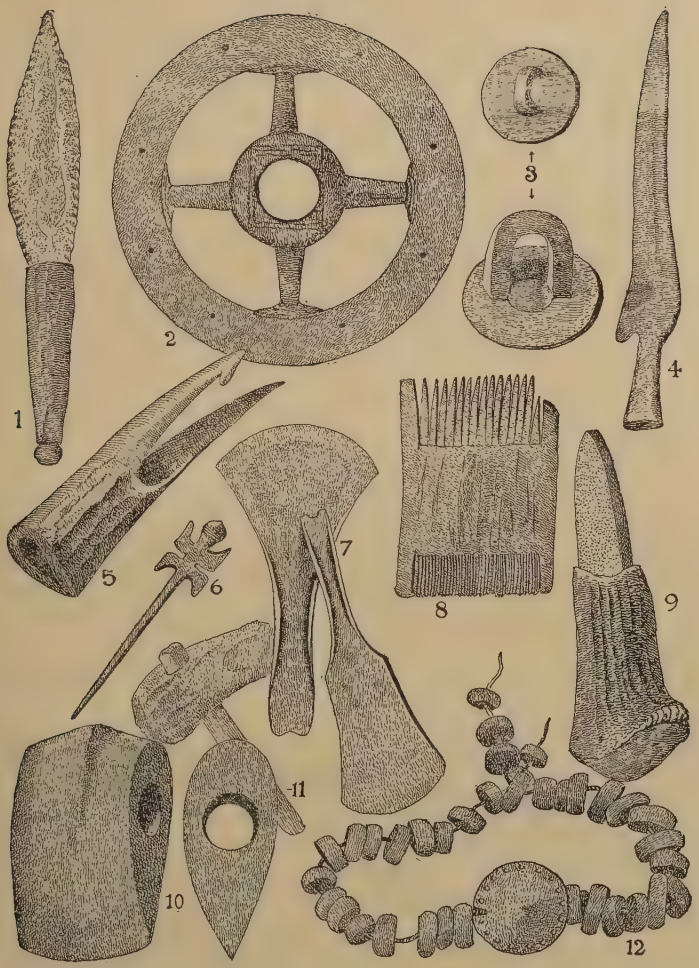
Balls of string were found also, and one of the human skulls had been used as a drinking-cup. These people of the lakes must have had daily need of ropes, and to make these they used different kinds of bark, besides twisting strands of flax together for cords. They had wheat and barley, but did not seem to make flour, baking their flat cakes of bread in hot ashes with the grains of corn bruised, and not finely sifted. Their mills were very primitive, consisting merely of flat stones, on which the grain was pounded.

A Mealing Stone

As time went on the household utensils became more elaborate. A housewife could boast of cups and saucers of sycamore-wood, and pottery decorated with wavy lines or triangles. She wore a pearl necklace, as well as the strings of pierced teeth which were the ornaments of her mother and grandmother, and often hung round her neck a string on which was threaded a carved bone pendant.

In districts where metal ores were found the people began to use copper and bronze instead of stone for their tools; but if only a chance metal dagger or knife came into a district where ore was not found it was sometimes carefully copied in stone.

From Neolithic times until our days the south of Scandinavia has been slowly rising. In the days before Neolithic man the country was covered with a sheet of ice and was uninhabitable, so that, as we have no Old Stone Age to consider, it is the best country for studying the stages of the New Stone Age.



RELICS OF THE SWISS LAKE-DWELLERS

1. Flint dagger in wooden handle. 2. Wheel. 3. Horn buttons. 4. Knife. 5. Horn spear. 6. Bone pin. 7. Forms of flat bronze celts. 8. Wooden comb. 9. Stone chisel in horn handle. 10. Stone axes. 11. Horn hammer-axe, with portion of wooden handle remaining. 12. Necklace of marble beads.

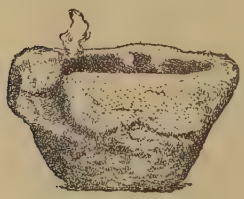
From "Cave, Mound, and Lake Dwellers," by Florence Holbrook. By permission of Messrs D. C. Heath and Company.

One of the earliest settlements was on a fresh-water lake which has silted up and formed a bog. This is on the west coast of Zealand in South Scandinavia. In early days the people lived on a huge raft of pine-logs anchored in shallow water.

A Canoe

Later on the raft was deserted, and people lived along the sea-coast, and to this day the rubbish they flung aside—the shell-fish, bones, and broken tools—can be seen in ridges parallel to the coast. In still later days, like their brothers in Switzerland, they made fine metal tools and built passages connecting the graves of their dead.

In England we know of a settlement of flint-miners of this date. The place is now called Grimes Graves, but it has nothing to do with a grave, and the stag-horn picks used by these early miners, as well as quantities of their tools, have been found here. With the picks they dislodged the big lumps of flint from the chalk in which they were embedded. Some of the mine-galleries go for a considerable way underground, and certain cup-shaped objects of chalk which were found here are thought to be the lamps used by the miners.



Lamp made of Chalk

Men travelled a good deal in those times, and,

indeed, they took the same routes as travellers follow to-day. To make the bronze weapons and utensils that they wanted, tin was a necessity, and so they sailed round the Mediterranean to Spain, and through the Straits of Gibraltar and the Bay of Biscay to the Scilly Isles and Cornwall in search of tin.

Men have always wanted to bring women ornaments and beautiful stones to wear, and they found that Siberia and China produced jade, and on the shores of the Baltic amber was washed up. The desire of their women for beautiful ornaments led them to these distant lands. Even to-day men bring back to us strings of amber beads from the Baltic, and jade from the Far East, so you see in some respects we have the same tastes as the folk of the New Stone Age and the Bronze Age.

Lake-villages existed for many centuries in different parts of the world; Herodotus the historian describes a lake-village which flourished in 500 B.C. on Lake Prasias, in Southern Macedonia. They still exist in New Guinea, and on the Amazon and Orinoco rivers, in South America. It is not likely that the people who built these lake-villages were the same race as those who set up the massive monuments to their dead which we call 'dolmens,' and which are the most imposing landmarks remaining to-day of Neolithic times.

CHAPTER XX

NEOLITHIC ARTS AND CRAFTS

YOU will begin to think that there is not much difference between the Neolithic people and ourselves, and in many ways you are right.

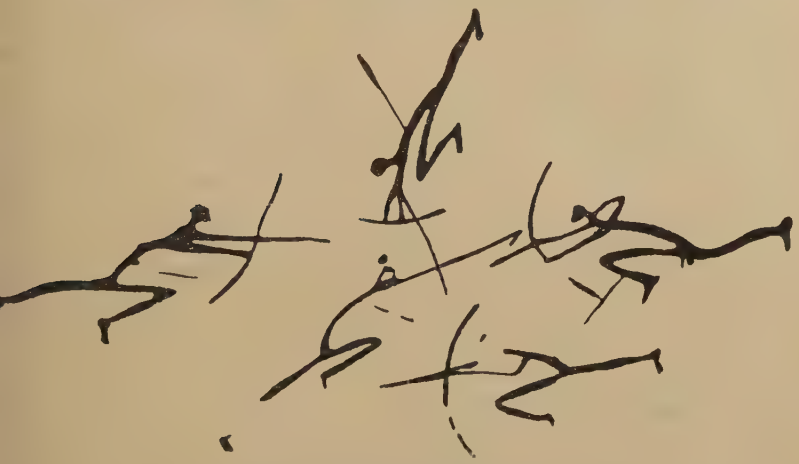
They had discovered how to tame and train horses, and the bronze bits they made for these animals we find in their lake-dwellings. They sowed fields of corn and barley and flax, built villages of wooden houses, and kept flocks and herds with the help of their dogs. They wore carefully made clothes, and evidently had an elaborate ritual, for they buried their dead with great care. In the Bronze Age they burnt the dead and buried the ashes in urns with drinking-cups, food-bowls, and anything which they thought the dead person might like or need. Many very interesting books have been written on the Bronze Age, and folk-lore is full of stories of heroes who lived at that time.

NEOLITHIC HOE

Let us glance at some of the many pictures left us by the Neolithic artists in the rock-shelters of Southern Spain.

These rock-shelters are not so mysterious as the dark caves of France and North Spain; they are mostly near the Spanish Riviera, and owe the

preservation of their paintings to the fine climate and lack of frost. Damp is the greatest enemy to cave-paintings, and water often filters from the surface through limestone walls; but rock-shelters, though dry, have to withstand the blurring effect of weathering on their walls, and so, in many cases where the figures are painted in red, water must



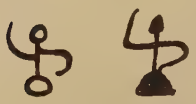
FIGHT OF THE BOWMEN

From a rock-shelter painting in Spain.
Reproduced by permission from "The Times."

be thrown on the walls nowadays before the design is really visible. If the paint is black this is not necessary. The cave-paintings, however, are protected from weathering, as they are usually some way from the entrance, and the sun cannot enter to bleach and burn, and the temperature in all seasons is fairly uniform. But in both caves and rock-shelters much depends on the variety of rock, the softer kinds (such as sandstone) being much less able to withstand the action of passing centuries and the

onslaughts of tiny lichens, which cling to any crack or niche and impose their own patterns on the old art.

The Neolithic paintings in Southern Spain are no longer processions or groups of well or badly drawn animals, but little people walking hand in hand, or leading animals by halters. The human figures are more like Dutch dolls than living people,



and in the end it is difficult to know just what we are looking at, so far has the design wandered from the original model. These people began to varnish their pottery, and this they did with a sticky substance made out of birch-bark, which when mixed with carbon-dust made a black glaze.

Arrow-heads were now made of either flint, quartz, bone, or even jade, and were sometimes fixed into their wooden hafts by means of a sticky substance rather like asphalt. Flint arrow-heads were used by some of the fighters in the battle of Marathon. Bows were made of yew, as were the famous English bows in later centuries.

In later Iron and Bronze days, from having been the ordinary everyday material of tools and weapons, flint became a talisman. There is a necklace in the British Museum made of gold and chiselled in a Greek or Etruscan pattern, the central ornament of which is a little flint arrow-head mounted in gold, which must have been intended as a mascot. In Scotland arrow-heads were eventually thought to be the weapons of elves, and were mounted in silver as talismans. It was believed that if these arrow-heads were put in the sun the elves would steal them.

The oldest metal tools were made of pure copper.

The process of refining was unknown. Gold was found in the sand, and contained a good deal of silver, men not having discovered how to separate it. Bronze tools succeeded the copper ones.

A Neolithic Bowman

The only real enemies to man in Western Europe at this time were the bear and the wolf. Caves had ceased to be homes and were used as graves, and we cannot help wondering what had become of the race of cave-dwellers. One of the striking points about Neolithic times is the immense variety in the races of people. Yet though we know a certain amount about their habits, their arts, and way of living, of the different races we know practically nothing. We have only to collect the stone axes of this date from various parts of Europe in order to see by their workmanship how varied must have been the capacity and skill of the Neolithic races. In Italy no axes of polished flint are found; they are all made of hard rock. In Eastern Siberia at this date, when stone axes were plentiful and arrow-heads most delicately made, the people built no monuments to their dead, and though they made pottery and used fine bone needles and stilettos they had no domestic animals.

CHAPTER XXI

THE DAYS OF WRITING BEGIN

IT is easy to say that our subject of prehistory stops whenever writing begins, but as writing was no sudden inspiration of one people, but cropped up in varying ages in different countries, it is more difficult than it seems to draw the line between prehistoric and historic times.

The Neolithic civilization, like its older counterparts, was not equally distributed over the world.

One could almost call the discovery of metal the herald of historic times; but we must remember the great variety in the degree of civilization in different countries when this important event took place, and the very wide stretches of time between its first use in one part of the world and another. For instance, Scandinavia reached its Bronze Age in the eighteenth or twentieth century before Christ. Polynesia reached it in the eighteenth century after Christ. Neolithic times were succeeded by historic times six thousand years before Christ in Egypt and Chaldea.

In most countries there was a Bronze Age, then an Iron Age, and then a long period of time before writing made an appearance. This was especially so in Central and Western Europe, but near the Mediterranean writing was known before the discovery of iron; so you see there is no rule ordering

the birth of written history in a nation. It is probable that painting, engraving, and sculpture, which are different ways of representing objects, led on by gradual steps to the representation of ideas, which is writing. The language of pictures, such as we find in Egypt, preceded the language of letters. In Chaldea, Elam, and Egypt the people were in the Eneolithic stage of civilization when writing occurred to them; that means they still knew nothing of all the Neolithic folk discovered. Elam was at the head of the Persian Gulf, and was inhabited by two races, one of which was negroid. The language of this country died out three thousand years before Christ.

Written history was born in the countries to the east of the Mediterranean, and the Chaldean seems to have been the first language of sounds to be written. At the end of the last Ice Age there was a great flood in Arabia, but neither Chaldea nor Arabia were inhabited at that date. The flood mentioned in the Bible must have been a secondary disaster, after which the Semites colonized the land. When Egypt was writing in pictures Arabia knew no kind of writing, and probably the Semites knew nothing about the writing of sounds till after their arrival on the shores of the Euphrates or Tigris. Then their language developed until it possessed an almost complete alphabet.

We have reached the end of our subject, since henceforth events and people can be recorded in writing. The old, dim days of the story-teller, the painter-priest, and the medicine-man magician are no more, yet the longings and hopes and fears of men alter but little; and we of the twentieth

century with our newspapers and popular novels, our picture-galleries and cinematographs, our followers of M. Coué and Christian Scientists, we know that, though untold centuries divide us from our early ancestors, in many ways we are only a step apart. Like them we shall pass away, and be no more than they were, each in turn a stage in a cycle the range of which is beyond human grasp.

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